

MIDDLE FOLDING STITCHING APPARATUS

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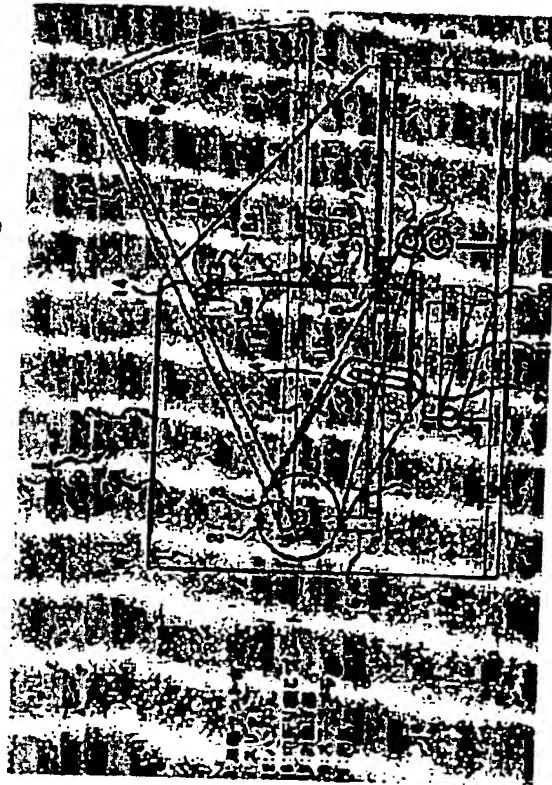
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Abstract of JP2003054833

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SOLUTION: This apparatus is provided with a paper setting table 3 having a slit 7 for setting a plurality of sheets of stacked paper P1, a middle folding stitching plate 16 which is movably mounted between a waiting position not entering the slit 7 of the paper setting table 3 and a middle folding and stitching position entering the slit 7 and comprises a staple bending part 19 at an entering tip of the slit 7, and a stapler 20 for stapling the paper P1 through which the middle folding stitching plate 16 is in pressure contact with the stapler 20 in a position of middle folding and stitching. In cooperation with operation of a handle 12 the middle folding and stitching plate 16 moves between the waiting position and the middle folding and stitching position.



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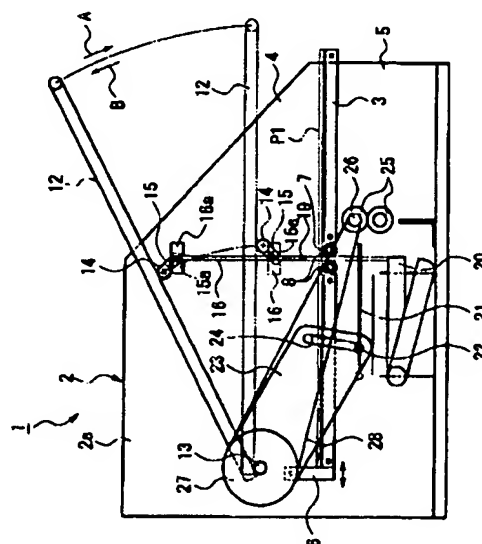
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(54) 【発明の名称】 中折り綴じ装置

(57) 【要約】

【課題】 中折り、中綴じの位置精度が良好で、しかも装置の構造が簡単である。

【解決手段】 スリット7を有し、複数の重畳された用紙P1がセットされる用紙セット台3と、用紙セット台3のスリット7に進入しない待機位置とスリット7に進入する中折り綴じ位置との間で移動自在に設けられ、スリット7の進入先端に針曲げ部19を有する中折り綴じプレート16と、中折り綴じプレート16が中折り綴じ位置に位置する状態で用紙P1を介して圧接し、用紙P1に針打ちするステープラ20とを備え、ハンドル12の操作に連動して中折り綴じプレート16が待機位置と中折り綴じ位置との間で移動するようになっている。



3: 用紙セット台
7: スリット
12: ハンドル
16: 中折り綴じプレート
19: 針曲げ部
20: ステープラ
P1: 用紙

【特許請求の範囲】

【請求項1】 スリットが設けられ、このスリットが開口される上面側に用紙がセットされる用紙セット台と、この用紙セット台の前記スリットに進入しない待機位置と該スリットに進入する中折り綴じ位置との間で移動自在に設けられ、前記スリットの進入先端に針曲げ部を有する中折り綴じプレートと、

この中折り綴じプレートが中折り綴じ位置に位置する状態で前記用紙を介して圧接し、前記用紙に針打ちするステープラとを備えたことを特徴とする中折り綴じ装置。

【請求項2】 請求項1記載の中折り綴じ装置であって、

手動で操作可能なハンドルを設け、このハンドルの操作に連動して前記中折り綴じプレートが待機位置と中折り綴じ位置との間で移動するようにしたことを特徴とする中折り綴じ装置。

【請求項3】 請求項1記載の中折り綴じ装置であって、

モータを設け、このモータの駆動力で前記中折り綴じプレートが待機位置と中折り綴じ位置との間で移動するようにしたことを特徴とする中折り綴じ装置。

【請求項4】 請求項1～請求項3記載の中折り綴じ装置であって、

前記スリット内に一对の導入ロールを設け、この一对の導入ロール間に前記中折り綴じプレートが前記用紙と共に進入するようにしたことを特徴とする中折り綴じ装置。

【請求項5】 請求項4記載の中折り綴じ装置であって、

前記一对の導入ロールは、離接方向に移動自在で、且つ、接触する方向に付勢手段により付勢されていることを特徴とする中折り綴じ装置。

【請求項6】 請求項4又は請求項5記載の中折り綴じ装置であって、

前記一对の導入ロールは、中折り綴じプレートの待機位置から中折り綴じ位置への移動に際し、中折りされた用紙と共に移動する方向に回転することを特徴とする中折り綴じ装置。

【請求項7】 請求項6記載の中折り綴じ装置であって、

前記一对の導入ロールは、前記中折り綴じプレートが待機位置から中折り綴じ位置に進む際に、前記ハンドルの操作に連動して回転することを特徴とする中折り綴じ装置。

【請求項8】 請求項6記載の中折り綴じ装置であって、

前記一对の導入ロールは、前記モータの駆動力で回転することを特徴とする中折り綴じ装置。

【請求項9】 請求項1～請求項8記載の中折り綴じ装置であって、

前記中折り綴じプレートが中折り綴じ位置から待機位置に戻る際に、中折り綴じされた前記用紙を排出方向に導く用紙導出部材を設けたことを特徴とする中折り綴じ装置。

【請求項10】 請求項9記載の中折り綴じ装置であって、

前記用紙導出部材によって前記用紙が導かれる位置に一对の折り付けロールを設け、この一对の折り付けロール間に進入した前記用紙を回転によって排出方向に移動するようにしたことを特徴とする中折り綴じ装置。

【請求項11】 請求項9又は請求項10記載の中折り綴じ装置であって、

前記用紙導出部材は、前記中折り綴じプレートが中折り綴じ位置から待機位置に戻る際に、前記ハンドルや前記中折り綴じプレートの操作に連動して移動することを特徴とする中折り綴じ装置。

【請求項12】 請求項10又は請求項11記載の中折り綴じ装置であって、

前記一对の折り付けロールは、前記ハンドルの操作に連動して回転することを特徴とする中折り綴じ装置。

【請求項13】 請求項10又は請求項11記載の中折り綴じ装置であって、

前記一对の折り付けロールは、前記モータの駆動力で回転することを特徴とする中折り綴じ装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、複数の重畳（積層）された用紙を中折りし、この中折りした位置で針止めにより綴じる中折り綴じ装置に関する。

【0002】

【従来の技術】この種の従来の中折り綴じ装置としては、図24に示すものがある。図24に示すように、中折り綴じ装置100は、上下方向に配置され、複数の重畳された用紙がそれぞれ載置される複数の給紙台101と、この給紙台101にセットされた複数の用紙を給紙する図示しない用紙給紙手段と、この用紙給紙手段により給紙された複数の用紙を針打ち位置と中綴じ位置とにそれぞれ搬送してセットする用紙搬送手段102と、この用紙搬送手段102で針打ち位置にセットされた複数の用紙に針（いわゆるステープル）を打つ針打ち手段103と、前記用紙搬送手段102で中綴じ位置にセットされた複数の用紙を中折りする中折り手段104と、この中折り手段104により中折りされた複数の用紙を排出方向に移動する用紙排出手段105と、この用紙排出手段105により搬送されてくる中折り綴じされた用紙Pをトリミングするトリマー手段106と、このトリマー手段106により排出された中折り中綴じされた用紙Pを載置する排紙台107とを備えている。

【0003】上記構成において、給紙台101にセットされた複数の用紙が用紙給紙手段を介して用紙搬送手段

102に搬送され、この用紙搬送手段102で複数の用紙が針打ち位置にセットされる。この針打ち位置にセットされた複数の用紙に対して針打ち手段103が針を打ち、これで複数の用紙の所望の針打ち位置に針が打たれて綴じられる。

【0004】次に、複数の用紙が用紙搬送手段102により中折り位置にセットされる。この中折り位置にセットされた複数の用紙に対して中折り手段104が中折りをを行い、これで複数の用紙が針打ち位置で中折りされる。中折り中綴じされた用紙Pは用紙排出手段105により搬送されてトリマー手段106に導かれ、トリマー手段106でトリミングされた後に排紙台107に排紙される。

【0005】

【発明が解決しようとする課題】しかしながら、前記従来の中折り綴じ装置100では、針打ち手段103が用紙に針打ちをする針打ち位置と、中折り手段104が用紙に中折りをする中折り位置とが同じ位置となるように位置合わせを行う必要があり、双方の位置がずれると良好な中折りで、且つ、中綴じられた用紙Pを得ることができない。良好な中折りで、且つ、中綴じされた用紙Pを得るためには位置合わせ機構が必要であり、構造が複雑化する等の問題があった。

【0006】そこで、本発明は、前記した課題を解決すべくなされたものであり、中折り、中綴じの位置精度が良好で、しかも構造が簡単である中折り綴じ装置を提供することを目的とする。

【0007】

【課題を解決するための手段】請求項1の発明は、スリットが設けられ、このスリットが開口される上面側に用紙がセットされる用紙セット台と、この用紙セット台の前記スリットに進入しない待機位置と該スリットに進入する中折り綴じ位置との間で移動自在に設けられ、前記スリットの進入先端に針曲げ部を有する中折り綴じプレートと、この中折り綴じプレートが中折り綴じ位置に位置する状態で前記用紙を介して圧接し、前記用紙に針打ちするステープラとを備えたことを特徴とする。

【0008】この中折り綴じ装置では、用紙セット台に中折りしたい位置をスリット位置になるように用紙をセットし、中折り綴じプレートを待機位置から中折り綴じ位置方向に移動すると、中折り綴じプレートの先端の位置で用紙が中折りされつつスリット内に挿入され、中折り綴じプレートが中折り綴じ位置まで移動すると、中折り綴じプレートの先端の位置で用紙にステープラによって針打ちされることから用紙の中折り位置と中綴じ位置とが必然的に一致し、位置決め機構を付加する必要がない。

【0009】請求項2の発明は、請求項1記載の中折り綴じ装置であって、手動で操作可能なハンドルを設け、このハンドルの操作に連動して前記中折り綴じプレート

が待機位置と中折り綴じ位置との間で移動するようにしたことを特徴とする。

【0010】この中折り綴じ装置では、請求項1の発明の作用に加え、ユーザの手動で中折り綴じ操作ができる。

【0011】請求項3の発明は、請求項1記載の中折り綴じ装置であって、モータを設け、このモータの駆動力で前記中折り綴じプレートが待機位置と中折り綴じ位置との間で移動するようにしたことを特徴とする。

【0012】この中折り綴じ装置では、請求項1の発明の作用に加え、モータの駆動力で中折り綴じ操作ができる。

【0013】請求項4の発明は、請求項1～請求項3記載の中折り綴じ装置であって、前記スリット内に一對の導入ロールを設け、この一對の導入ロール間に前記中折り綴じプレートが前記用紙と共に進入するようにしたことを特徴とする。

【0014】この中折り綴じ装置では、請求項1～請求項3の発明の作用に加え、中折り綴じプレートの移動によって複数の用紙がスリット内に挿入される過程で、複数の用紙が一對の導入ロールの回転によりスムーズに移動される。

【0015】請求項5の発明は、請求項4記載の中折り綴じ装置であって、前記一對の導入ロールは、離接方向に移動自在で、且つ、接触する方向に付勢手段により付勢されていることを特徴とする。

【0016】この中折り綴じ装置では、請求項4の発明の作用に加え、複数の用紙の全体の厚みに応じて一對の導入ロール間が可変し、且つ、付勢手段によって所定の挟持力を作用させる。

【0017】請求項6の発明は、請求項4又は請求項5記載の中折り綴じ装置であって、前記一對の導入ロールは、中折り綴じプレートの待機位置から中折り綴じ位置への移動に際し、中折りされた用紙と共に移動する方向に回転することを特徴とする。

【0018】この中折り綴じ装置では、請求項4又は請求項5の発明の作用に加え、用紙が中折り綴じプレートに押圧されて中折りされる際に、一對の導入ロールが用紙と共に送り込む。

【0019】請求項7の発明は、請求項6記載の中折り綴じ装置であって、前記一對の導入ロールは、前記中折り綴じプレートが待機位置から中折り綴じ位置に進む際に、前記ハンドルの操作に連動して回転することを特徴とする。

【0020】この中折り綴じ装置では、請求項6の発明の作用に加え、一對の導入ロールの駆動を別途行う必要がない。

【0021】請求項8の発明は、請求項6記載の中折り綴じ装置であって、前記一對の導入ロールは、前記モータの駆動力で回転することを特徴とする。

【0022】この中折り綴じ装置では、請求項6の発明に加え、中折り綴じプレートを駆動するモータによって一対の導入ロールの駆動がなされる。

【0023】請求項9の発明は、請求項1～請求項8記載の中折り綴じ装置であって、前記中折り綴じプレートが中折り綴じ位置から待機位置に戻る際に、中折り綴じされた前記用紙を排出方向に導く用紙導出部材を設けたことを特徴とする。

【0024】この中折り綴じ装置では、請求項1～請求項8の発明の作用に加え、中折り綴じされた用紙が取りやすい位置まで排出される。

【0025】請求項10の発明は、請求項9記載の中折り綴じ装置であって、前記用紙導出部材によって前記用紙が導かれる位置に一対の折り付けロールを設け、この一対の折り付けロール間に進入した前記用紙を回転によって排出方向に移動するようにしたことを特徴とする。

【0026】この中折り綴じ装置では、請求項9の発明の作用に加え、中折り綴じされた用紙がより取りやすい位置まで排出されると共に良好な中折りがなされる。

【0027】請求項11の発明は、請求項9又は請求項10記載の中折り綴じ装置であって、前記用紙導出部材は、前記中折り綴じプレートが中折り綴じ位置から待機位置に戻る際に、前記ハンドルの操作に連動して移動することを特徴とする。

【0028】この中折り綴じ装置では、請求項9又は請求項10の発明の作用に加え、用紙導出部材の駆動を別途行う必要がない。

【0029】請求項12の発明は、請求項10又は請求項11記載の中折り綴じ装置であって、前記一対の折り付けロールは、前記ハンドルの操作に連動して回転することを特徴とする。

【0030】この中折り綴じ装置では、請求項10又は請求項11の発明の作用に加え、一対の折り付けロールの回転駆動を別途行う必要がない。

【0031】請求項13の発明は、請求項10又は請求項11記載の中折り綴じ装置であって、前記一対の折り付けロールは、前記モータの駆動力で回転することを特徴とする。

【0032】この中折り綴じ装置では、請求項10又は請求項11の発明に加え、中折り綴じプレートを駆動するモータ、または、これに加えて一対の導入ロールを駆動するモータによって一対の折り付けロールの駆動がなされる。

【0033】

【発明の実施の形態】以下、本発明の実施形態を図面に基づいて説明する。

【0034】図1～図6は本発明の第1実施形態を示し、図1は中折り綴じ装置の斜視図、図2は中折り綴じ装置の概略構成図、図3は中折り綴じ装置の要部の斜視図、図4は用紙セット台に複数の用紙がセットされた状

態を示す概略構成図、図5は中折り綴じプレートが中折り綴じ位置に位置する状態を示す概略構成図、図6は中折り綴じプレートが中折り綴じ位置から待機位置に戻された状態を示す概略構成図である。

【0035】図1～図3に示すように、中折り綴じ装置1の筐体2は、一定間隔を置いて平行に立設された一対の側板2a、2aと、この一対の側板2a、2a間を後方で一体連結する後板2bとを有する。一対の側板2a、2a間には水平方向に配置された用紙セット台3が固定されており、この用紙セット台3の上方スペースが給紙スペース4とされ、該用紙セット台3の下方スペースが排紙スペース5とされている。用紙セット台3上に前方より複数の重畳（積層）された用紙P1をセットし、用紙セット台3の下方の前方より中折り中綴じされた用紙P2を取り出すようになっている。

【0036】また、用紙セット台3の後方にはストッパ部材6が設けられ、このストッパ部材6によって用紙P1を用紙セット台3上の所定の位置に容易にセットできるようになっている。即ち、複数の用紙P1をストッパ部材6に突き当たるまで進入させることによって複数の用紙P1の中折り綴じしたい位置をスリット位置に合わせてセットできるようになっている。また、ストッパ部材6は、用紙セット台3の前後方向に移動自在に、且つ、適宜の位置で位置決めできるようになっており、これにより各種サイズの用紙P1について、且つ、中折り綴じ位置を所望の位置に可変することができるようになっている。さらに、用紙セット台3の略中央にはスリット7が設けられ、このスリット7は左右方向に延びており、且つ、少なくとも中折り中綴じされる用紙P1の幅よりも長寸法に設けられている。

【0037】図2に示すように、スリット7内には一対の導入ロール8、8が回転自在に設けられており、この各導入ロール8の支軸8aの一端側には互いに噛み合うギア9がそれぞれ固定されている。図3に示すように、一方の導入ロール8の支軸8aの他端側にはピニオン10が固定され、このピニオン10が後述する中折り綴じプレート16のラック18に噛み合っている。つまり、一対の導入ロール8、8は中折り綴じプレート16の待機位置から中折り綴じ位置への移動に連動し、中折りされた用紙P1を中折り綴じプレート16と共に移動する方向に回転されるようになっている。また、一対の導入ロール8、8は、ギア9の噛み合いを保持しつつ互いに離接方向に移動自在で、且つ、接触する方向に付勢手段であるバネ11によって付勢されている。さらに、各導入ロール8と各支軸8aとの間には図示しないワンウェイクラッチが介在されており、各導入ロール8は用紙P1をスリット7内に進入させる方向の回転が各支軸8aより伝達され、その反対方向の回転が伝達不能とされている。

【0038】図1～図3に示すように、一対の側板2

a, 2a間にはハンドル12がその基端側を支軸13を介して回転自在に支持され、その先端側が用紙セット台3の上方に配置されることによってユーザが手動で操作できるように設けられている。このハンドル12の操作は、図2の矢印A方向の送り操作と、図2の矢印B方向の戻り操作である。また、ハンドル12の中間位置の下方には押圧ロール14が回転自在に支持され、この押圧ロール14は中折り綴じプレート16の押圧作用部16a上に当接されている。

【0039】中折り綴じプレート16は、用紙セット台3の上方位置で、且つ、用紙セット台3のスリット7の位置に対応する上方位置に配置されている。中折り綴じプレート16の左右両端部分の一部は一对の側板2a, 2aにそれぞれ設けられた図1に示すガイド孔17に挿入され、このガイド孔17は上下方向に延びている。また、中折り綴じプレート16の上端には押圧作用部16aが固定されている。この押圧作用部16aとハンドル12の押圧ロール14を支持する部材とは連結部材15を介して連結され、押圧作用部16aと連結部材15との間は長孔15aを介して連結されることによって、多少のリンク長を可変しつつ連結を保持するようになっている。そして、中折り綴じプレート16はハンドル12の操作に連動して用紙セット台3のスリット7に進入しない図2にて実線で示す待機位置と、用紙セット台3のスリット7に進入する図2にて仮想線で示す中折り綴じ位置との間で移動されるようになっている。

【0040】さらに、中折り綴じプレート16の一端側の側板2aより突出した箇所にはラック18が設けられ、このラック18が前記したように一对の導入ロール8, 8のピニオン10に噛み合っている。そして、一方の中折り綴じプレート16の待機位置から中折り綴じ位置への移動に際して一对の導入ロール8, 8が回転するようになっている。つまり、一对の導入ロール8, 8もハンドル12の送り操作に連動して回転されるようになっている。

【0041】また、中折り綴じプレート16の下端、つまり、スリット7の進入先端であって、且つ、一对のステープラ20, 20に対応する位置には針曲げ部19がそれぞれ設けられている。この各ステープラ20は、用紙セット台3のスリット7の下方位置に固定されており、上方に向かってコ字状の針（いわゆるステープル）30を打つように配置されている。また、各ステープラ20は、中折り綴じ位置に位置する中折り綴じプレート16に対して用紙P1を介して圧接され、この圧接力によって用紙P1に針30を打つように設定されている。

【0042】図1～図3に示すように、一对の側板2a, 2a間の用紙セット台3の下方位置には用紙導出部材21が水平方向にスライド自在に設けられている。この用紙導出部材21の支持ピン22は、ハンドル12の支軸13に固定された揺動プレート23のカム孔24に

係合され、ハンドル12の回転操作に連動して移動されるようになっている。つまり、中折り綴じプレート16を中折り綴じ位置とするハンドル12の下位置では、スリット7の下方位置より退出して用紙P1の進入を許容し、且つ、用紙P1を排出方向に導かない図2にて仮想線で示す待機位置に位置し、中折り綴じプレート16を待機位置とするハンドル12の上位置では、スリット7の下方位置より突出して用紙P2を排出方向に導く図2にて実線で示す導出位置に位置するようになっている。

【0043】また、一对の側板2a, 2a間の用紙セット台3の下方位置で、且つ、用紙導出部材21によって中折り中綴じされた用紙P2が導かれる位置には、一对の折り付けロール25, 25が設けられている。この一对の折り付けロール25, 25の一方の支軸25aにはプーリ26が設けられ、このプーリ26とハンドル12の支軸13に固定されたプーリ27との間にはベルト28が掛けられている。各折り付けロール25と各支軸25aの間には図示しないワンウェイクラッチが介在されており、中折り中綴じされた用紙P2を排出方向に移動する回転方向の回転のみが各支軸25aから折り付けロール25に伝達可能になっている。つまり、ハンドル12が下位置から上位置に回転操作されると、この回転がベルト28を介して一对の折り付けロール25, 25に伝達され、この一对の折り付けロール25, 25が挟持された用紙P2を排出方向に移動するべく回転されるようになっている。

【0044】次に、中折り綴じ装置1の中折り綴じ動作を説明する。所定サイズ of 用紙P1の丁度中間位置で中折りし、且つ、中綴じする場合を例に説明すると、ストップ部材6は、所定サイズの用紙P1をストップ部材6に当接するように用紙セット台3に載置した際に、用紙P1の丁度中間位置がスリット7の位置となるように位置調整されている。

【0045】図4に示すように、ユーザが用紙セット台3上に複数の重畳された用紙P1を挿入し、用紙P1の挿入先端面がストップ部材6に当接する位置にセットし、次に、ハンドル12を図4の矢印A方向に送り操作すると、待機位置の中折り綴じプレート16が用紙P1の上方から降下して用紙P1に当接し、この状態より更にハンドル12を送り操作すると、用紙P1が中折り綴じプレート16によってその当接位置で折曲されつつ中折り綴じプレート16と共に用紙セット台3のスリット7に挿入される。

【0046】また、中折り綴じプレート16の降下によって一对の導入ロール8, 8が用紙P1を中折り綴じプレート16と共に移動させる方向に回転し、用紙P1がスムーズにスリット7内に挿入される。また、ハンドル12の送り操作によって用紙導出部材21がスリット7の下方位置である導出位置より退出して中折り綴じプレート16及びこれに伴い挿入される用紙P1の移動が許

容される。

【0047】そして、ユーザは、中折り綴じプレート16が中折り綴じ位置に達するとハンドル12の送り操作を停止する。図5に示すように、中折り綴じプレート16が中折り綴じ位置まで降下すると、中折り綴じプレート16の針曲げ部19が用紙P1を介して一對のステープラ20、20に圧接される。この圧接力によって各ステープラ20が針打ちを行い、用紙P1に打たれた針30の先端が針曲げ部19で曲げられる。これで、複数の重畳された用紙P1が中折りされ、且つ、中綴じされた用紙P2となる。

【0048】次に、ユーザがハンドル12を図6の矢印B方向に戻り操作すると、このハンドル12の戻り操作に連動して中折り綴じプレート16が上昇するが、一對の導入ロール8、8がワンウェイクラッチによって中折り綴じプレート16の移動に連動せずに回転駆動しないことも相俟って、中折り中綴じ状態の用紙P2が中折り綴じプレート16とともに上昇せずにその位置に留まる。また、ハンドル12の戻り操作に連動して用紙導出部材21が待機位置からスリット7の下方位置である導出位置まで突出し、中折り中綴じされた用紙P2を排出方向の一對の折り付けロール25、25側に導く。この一對の折り付けロール25、25はハンドル12の戻り操作に連動して中折り中綴じされた用紙P2を排出方向に移動させる方向に回転している。そのため、図6に示すように、中折り中綴じされた用紙P2が一對の折り付けロール25、25の間を通過して排出方向に更に導かれる。

【0049】そして、ユーザがハンドル12の戻し操作を終えると、一對の折り付けロール25、25より突出した中折り中綴じされた用紙P2を、一對の折り付けロール25、25間より引き抜く。すると一對の折り付けロール25、25はワンウェイクラッチによって空転し、中折り綴じされた用紙P2が容易に引き抜かれる。尚、一對の導入ロール8、8もワンウェイクラッチによって空転するため、中折り綴じされた用紙P2の引き抜きを妨げない。

【0050】以上、前記中折り綴じ装置1では、用紙セット台3に中折りしたい位置をスリット7の位置になるように用紙P1をセットし、中折り綴じプレート16を待機位置から中折り綴じ位置方向に移動すると、中折り綴じプレート16の先端の位置で用紙P1が中折りされつつスリット7内に挿入され、中折り綴じプレート16が中折り綴じ位置まで移動すると、中折り綴じプレート16の先端の位置で用紙P1にステープラ20によって針打ちされることから用紙P1の中折り位置と中綴じ位置とが必然的に一致し、位置決め機構を付加する必要がない。従って、中折り、中綴じの位置精度が良好で、しかも構造が簡単な中折り綴じ装置1を提供できる。

【0051】また、前記第1実施形態では、ユーザが手

動で操作できるハンドル12を設け、このハンドル12の操作に連動して中折り綴じプレート16が待機位置と中折り綴じ位置との間で移動するので、ユーザの手動で中折り綴じ操作ができるため、より構造が簡単で、コスト安にできる。

【0052】また、前記第1実施形態では、スリット7内に一對の導入ロール8、8を設け、この一對の導入ロール8、8間に中折り綴じプレート16が用紙P1と共に進入するように設けたので、中折り綴じプレート16の移動によって複数の用紙P1がスリット7内に挿入される過程で、複数の用紙P1が一對の導入ロール8、8の回転によりスムーズに移動されるため、用紙P1に極力ダメージを与えることなく中折り動作を行うことができる。

【0053】前記第1実施形態では、一對の導入ロール8、8は、離接方向に移動自在で、且つ、接触する方向に付勢手段であるバネ11により付勢されているので、複数の用紙P1の全体の厚みに応じて一對の導入ロール8、8間が可変し、且つ、付勢手段であるバネ11によって所定の挟持力を作用させるため、種々の全体厚みの用紙P1に対して中折りを行うことができる。また、一對の導入ロール8、8は、中折り綴じプレート16の待機位置から中折り綴じ位置への移動に際し、挟持された用紙P1と共に移動する方向に回転するので、用紙P1が中折り綴じプレート16に押圧されて中折りされる際に、一對の導入ロール8、8が用紙P1と共に送り込むため、用紙P1の中折りがスムーズに行われる。さらに、一對の導入ロール8、8は、中折り綴じプレート16が待機位置から中折り綴じ位置に進む際に、ハンドル12の操作に連動して回転するので、一對の導入ロール8、8の駆動を別途行う必要がないため、ユーザの使い勝手が良い。

【0054】また、前記第1実施形態では、中折り綴じプレート16が中折り綴じ位置から待機位置に戻る際に、中折り綴じされた用紙P2を排出方向に導く用紙導出部材21を設けたので、中折り綴じされた用紙P2が取りやすい位置まで排出されるため、ユーザの使い勝手が良い。

【0055】また、前記第1実施形態では、用紙導出部材21によって用紙P2が導かれる位置に一對の折り付けロール25、25を設け、この一對の折り付けロール25、25間に進入した用紙P2を回転によって排出方向に移動するので、中折り綴じされた用紙P2がより取りやすい位置まで排出されると共に良好な中折りがなされるため、ユーザの使い勝手が非常に良い。さらに、用紙導出部材21は、中折り綴じプレート16が中折り綴じ位置から待機位置に戻る際に、ハンドル12の操作に連動して移動するので、用紙導出部材21の駆動を別途行う必要がないため、ユーザの使い勝手が良い。

【0056】さらに、前記第1実施形態では、一對の折

り付けロール25、25は、ハンドル12の操作に連動して回転するので、一对の折り付けロール25、25の回転駆動を別途行う必要がないため、ユーザの使い勝手が良い。

【0057】尚、前記第1実施形態では、中折り綴じ装置1は動力源を一切使用せずに構成されているので、従来例に比較して非常に低コストで作製することができる。

【0058】図7～図22は、本発明の第2実施形態を示し、図7は中折り綴じ装置の斜視図、図8は中折り綴じプレートが待機位置に位置する中折り綴じ装置の概略構成図、図9は中折り綴じ駆動機構の中折り綴じ駆動系の要部の正面図、図10は中折り綴じ駆動機構の中折り綴じ駆動系の平面図、図11は中折り綴じ機構の用紙排出系の要部の正面図、図12は中折り綴じ機構の用紙排出系の平面図、図13～図15は中折り綴じ動作の各過程を示す中折り綴じ装置の概略構成図、図16～図20は中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図、図21はカウンター機構の平面図、図22はカウンター機構の正面図である。

【0059】図7及び図8に示すように、中折り綴じ装置31の筐体32は、一定間隔を置いて平行に立設された一对の側板32a、32aと、この一对の側板32a、32a間を後方で一体連結する後板32bと、一对の側板32a、32a間を前方で一体連結する前板32cと、一对の側板32a、32a間を上方で一体連結する上板32dとを有する。一对の側板32a、32a間には水平方向に配置された用紙セット台33が固定されており、この用紙セット台33の上方で、且つ、前板32cとの間隙スペースが給紙スペース34とされ、該用紙セット台33の下方スペースが排紙スペース35とされている。用紙セット台33上に前方より複数の重畳（積層）された用紙P1をセットし、用紙セット台33の下方の前方より中折り中綴じされた用紙P2を取り出すようになっている。

【0060】用紙セット台33の後方には、前記第1実施形態と同様に、ストッパ部材36が設けられ、このストッパ部材36によって用紙P1を用紙セット台33上の所定の位置に容易にセットできるようになっている。ストッパ部材36は、用紙セット台33の前後方向に移動自在に、且つ、適宜の位置で位置決めできる。これにより各種サイズの用紙P1について、且つ、中折り綴じ位置を所望の位置に可変することができるようになっている。

【0061】用紙セット台33の前方位置で、且つ、左右のエッジ位置近くには一对の用紙左右ガイド37、37が設けられており、この一对の用紙左右ガイド37、37によって複数の用紙P1を左右ズレすることなく、且つ、左右同一位置にセットできるようになっている。

【0062】用紙セット台33の略中央にはスリット3

8が設けられ、このスリット38は左右方向に延びており、且つ、中折り中綴じされる用紙P1の幅よりも十分に長寸法に設けられている。

【0063】一对の導入ロール39、39は、スリット38内に回転自在に設けられている。この各導入ロール39は、例えば硬度60度程度の表面ゴム製であり、摩擦力のみを要求し弾性を要求しないものとして構成されている。各導入ロール39、39の支軸39a、39aの一端側には互いに噛み合うギア40、40がそれぞれ固定されている。図12に示すように、一对の導入ロール39、39は、ギア40、40の噛み合いを保持しつつ互いに離接方向に移動自在で、且つ、接触する方向に付勢手段であるバネ41によって付勢されている。そして、この一对の導入ロール39、39は、用紙P1をスリット38内に進入させる方向に中折り綴じ駆動機構42の用紙排出系によって回転駆動される。

【0064】また、各導入ロール39と各支軸39aとの間には図示しないワンウェイクラッチが介在されており、一对の導入ロール39、39は用紙P1をスリット38内に進入させる方向の回転が各支軸39aより伝達されるが、その反対方向の回転が伝達不能とされている。これによって、一对の導入ロール39、39は、中折り綴じプレート43の待機位置から中折り綴じ位置への移動に際し、中折りされた用紙P1を中折り綴じプレート43と共に移動する方向に自由回転されるようになっている。

【0065】中折り綴じプレート43は、用紙セット台33の上方位置で、且つ、用紙セット台33のスリット38の位置に対応する上方位置に配置されている。中折り綴じプレート43の上端部には左右両端より突出するガイドピン44が設けられ、この左右のガイドピン44は一对の側板32a、32aにそれぞれ設けられたガイド孔45に挿入され、このガイド孔45は上下方向に延びている。そして、中折り綴じプレート43は、用紙セット台33のスリット38に進入しない図8の待機位置と、用紙セット台33のスリット38に進入する図15の中折り綴じ位置との間を中折り綴じ駆動機構42の中折り綴じ駆動系によって駆動される。

【0066】また、中折り綴じプレート43の下端、つまり、スリット38の進入先端であって、且つ、一对のステープラ46、46に対応する位置には、前記第1実施形態と同様に、針曲げ部（図示省略）がそれぞれ設けられている。この各ステープラ46は、用紙セット台33のスリット38の下方位置に固定されており、上方に向かってコ字状の針（いわゆるステープル）30を打つように配置されている。また、各ステープラ46は、中折り綴じ位置に位置する中折り綴じプレート43に対して用紙P1を介して圧接され、この圧接力によって用紙P1に針30を打つように設定されている。さらに、一对のステープラ46、46は、筐体32内に着脱自在に

配置されたステープラ台47上に固定され、このステープラ台47はつまみ47aの操作によって着脱できるようになっている。ステープラ台47は、バネ性を有する板金にて構成され、ステープラ46に作用する中折り綴じプレート43の押圧力を緩和するようになっている。

【0067】図8に示すように、一对の側板32a、32a間の用紙セット台33の下方位置には用紙導出部材48が水平方向にスライド自在に設けられている。この用紙導出部材48の左右端より突出された支持ピン49は、一对の側板32a、32aにそれぞれ設けられたガイド孔50に挿入され、このガイド孔50は水平方向に延びている。そして、用紙導出部材48は、スリット38の下方位置より退出して用紙P1の進入を許容し、且つ、用紙P1を排出方向に導かない図15の特機位置と、スリット38の下方位置より突出して用紙P2を排出方向に導く図8の導出位置との間を中折り綴じ駆動機構42の中折り綴じ駆動系によって駆動される。

【0068】また、一对の側板32a、32a間の用紙セット台33の下方位置で、且つ、用紙導出部材48によって中折り綴じされた用紙P2が導かれる位置には、一对の折り付けロール51、51が設けられている。この各折り付けロール51は例えば硬度60度以下のゴム製であり、弾性を有するものとして構成されている。この一对の折り付けロール51、51の支軸51a、51aの一端側には互いに噛み合うギア52、52がそれぞれ固定されている。さらに、一对の折り付けロール51、51は、ギア52、52の噛み合いを保持しつつ互いに離接方向に移動自在で、且つ、接触する方向に付勢手段であるバネ53によって付勢されている。このバネ53のバネ力は、一对の導入ロール39、39側の折り付けよりも強く折り付けを行うために、一对の導入ロール39、39側のバネ41よりも強く設定されている。そして、この一对の折り付けロール51、51は、挟持された用紙P1を排出させる方向に中折り綴じ駆動機構42の用紙排出系によって回転駆動される。

【0069】また、各折り付けロール51と各支軸51aとの間には図示しないワンウェイクラッチが介在しており、一对の折り付けロール51、51は用紙P2を排出させる方向の回転が各支軸51aより伝達されるが、その反対方向の回転が伝達不能とされている。これによって、一对の折り付けロール51、51は、挟持された用紙P2をユーザが排出方向に引っ張ると、自由回転してジャミングした用紙P2を容易に取り出すことができるようになっている。

【0070】次に、中折り綴じ駆動機構42を説明する。中折り綴じ駆動機構42の中折り綴じ駆動系は、図9及び図10に示すように、中折り綴じ装置31の唯一の駆動源である交流モータ60を有し、この交流モータ60の回転軸60aの外周には第1ワンウェイクラッチ61を介在して第1ギア62が設けられている。第1ワ

ンウェイクラッチ61は、交流モータ60の反時計方向（図9及び図11から見た場合で矢印A方向、以下同じ）の回転のみを第1ギア62に伝達し、交流モータ60の時計方向の回転では第1ギア62は空転される。第1ギア62には大径の第2ギア63が噛み合い、この第2ギア63にはその回転支持ピン63aの偏芯位置にカムピン65が固定されている。このカムピン65が揺動レバー66のカム孔66aに挿入されており、揺動レバー66は、側板32aに中心ピン67を支点として支持されている。揺動レバー66の上方側端には中折り綴じプレート43のガイドピン44が係合されており、第2ギア63の回転で揺動プレート65が揺動することによって中折り綴じプレート43が上下動される。揺動レバー65の下方側端には用紙導出部材48の支持ピン49が係合されており、第2ギア63の回転で揺動レバー66が揺動することによって用紙導出部材48が水平移動される。

【0071】また、第2ギア63には第3ギア64が噛み合い、この第3ギア64の支軸64aは他方の側板32aにまで延設され、他方の側板32aの側にも同じ機構（第3ギア64と第2ギア63及び揺動レバー66）が設けられている。これにより、中折り綴じプレート43及び用紙導出部材48の移動が確実、且つ、スムーズに行われるようになっている。

【0072】以上より、交流モータ60の反時計方向（図9の矢印A方向）の回転時にあって、中折り綴じプレート43が特機位置から中折り綴じ位置への往復移動を行うと共に、用紙導出部材48が特機位置から導出位置への往復移動を行う。そして、中折り綴じプレート43が特機位置では用紙導出部材48が導出位置に位置し、中折り綴じプレート43が中折り綴じ位置では用紙導出部材48が特機位置に位置するようになっている。

【0073】図11及び図12に示すように、中折り綴じ駆動機構42の用紙排出系は、中折り綴じ装置31の唯一の駆動源である交流モータ60を駆動源として兼用し、この交流モータ60の回転軸60aの外周には第2ワンウェイクラッチ70を介在して大径プーリ71が設けられている。この第2ワンウェイクラッチ70は、交流モータ60の時計方向（図9及び図11から見た場合で矢印B方向、以下同じ）の回転のみを大径プーリ71に伝達し、交流モータ60の反時計方向の回転では大径プーリ71は空転される。この大径プーリ71にはタイミングベルト72の一端側が掛けられ、タイミングベルト72の他端側は小径プーリ73に掛けられている。この小径プーリ73は、一方の導入ロール39の支軸39aに固定されている。又、他方の導入ロール39の支軸39aに固定されたギア40にはアイドルギア74が噛み合い、このアイドルギア74は一方の折り付けロール51の支軸51aのギア52に噛み合っている。

【0074】以上より、一对の導入ロール39、39及

び一对の折り付けロール51、51は、共に交流モータ60の時計方向(図11の矢印B方向)の回転時にあって挟持された用紙P2を排出する方向に回転駆動される。そして、一对の導入ロール39、39の周速度に対して一对の折り付けロール51、51の周速度は、20%以内の範囲で速くなるように設定されている。

【0075】次に、中折り綴じ駆動機構42の回路構成を図16～図20に基づいて説明する。図16～図20に示すように、交流モータ60は共通端子1と時計方向側端子2と反時計方向側端子3とを有し、時計方向側端子2と反時計方向側端子3との間にはコンデンサCが介在され、時計方向側端子2と反時計方向側端子3への電源入力を可変することによって回転方向が切り替えられる。交流モータ60と交流電源75の間には、スタートスイッチSW1とモータ逆転スイッチSW2とが介在され、これら2つのスイッチSW1、SW2によって時計方向側端子2と反時計方向側端子3への電源入力が切り替えられるようになっている。

【0076】スタートスイッチSW1は、図7に示す前板32cに設けられ、ユーザによって操作される。このスタートスイッチSW1は、内蔵バネによって時計方向選択側端子4に付勢され、ユーザの押下操作によって反時計方向選択側端子5に切り替えられるようになっている。

【0077】モータ逆転スイッチSW2は、図8等に示す筐体32内に設けられ、中折り綴じプレート43の位置によって操作される。このモータ逆転スイッチSW2は、内蔵バネによって反時計方向選択側端子6に付勢され、中折り綴じプレート43の待機位置及びその付近に対応する揺動レバー66の位置では揺動レバー66に押下されることによって時計方向選択側端子7に位置される。中折り綴じプレート43の上記位置以外に対応する揺動レバー66の位置では内蔵バネのバネ力によって反時計方向選択側端子6に位置される。

【0078】次に、中折り綴じ装置31の中折り綴じ動作を説明する。所定サイズ of 用紙P1の丁度中間位置で中折りし、且つ、中綴じする場合を例に説明すると、ストッパ部材36は、所定サイズの用紙P1をストッパ部材36に当接するように用紙セット台33に載置した際に、用紙P1の丁度中間位置がスリット38の位置となるように位置調整する。

【0079】中折り綴じ装置31に電源を投入すると、図16に示すように、交流電源75の交流電流が交流モータ60の時計方向側端子2に入力され、交流モータ60が時計方向に回転する。交流モータ60の回転により、一对の導入ロール39、39及び一对の折り付けロール51、51が用紙排出方向に回転駆動される。このような状態にあって、図8に示すように、ユーザが用紙セット台33上に複数の重畳された用紙P1を挿入し、用紙P1の挿入先端面がストッパ部材36に当

接する位置にセットする。

【0080】次に、ユーザがスタートスイッチSW1を押下する。すると、図17に示すように、交流モータ60の反時計方向側端子3に電源入力が切り替えられ、交流モータ60が反時計方向に逆回転する。交流モータ60の反時計方向回転により、一对の導入ロール39、39及び一对の折り付けロール51、51の回転駆動が停止される一方で、中折り綴じプレート43が待機位置から中折り綴じ位置に、また、用紙導出部材48が導出位置から待機位置にそれぞれ移動を開始する。待機位置の中折り綴じプレート43が用紙P1の上方から降下して用紙P1に当接し、この状態より更に降下すると、用紙P1が中折り綴じプレート43によってその当接位置で折曲されつつ中折り綴じプレート43と共に用紙セット台33のスリット38に挿入される。中折り綴じプレート43の降下によって一对の導入ロール39、39が用紙P1を中折り綴じプレート43と共に移動させる方向に追従回転し、用紙P1がスムーズにスリット38内に挿入される。また、用紙導出部材48がスリット38の下方位置である導出位置より退出することにより中折り綴じプレート43及びこれに伴い挿入される用紙P1の移動が許容される。

【0081】また、上記動作過程にあって、スタートスイッチSW1を押下した後、揺動レバー66が少し移動すると、図18及び図19に示すように、揺動レバー66がモータ逆転スイッチSW2を押圧しなくなるため、モータ逆転スイッチSW2が反時計方向選択側に切り替えられ、ユーザがスタートスイッチSW1の押下を解除しても交流モータ60は反時計方向に回転し続ける。

【0082】そして、図13に示すように、中折り綴じプレート43が中折り綴じ位置まで降下すると、中折り綴じプレート43の針曲げ部が用紙P1を介して一对のステープラ46、46に圧接される。この圧接力によって各ステープラ46が針打ちを行い、用紙P1に打たれた針30の先端が針曲げ部で曲げられる。これで、複数の重畳された用紙P1が中折りされ、且つ、中綴じされた用紙P2となる。

【0083】次に、中折り綴じプレート43が中折り綴じ位置まで降下すると、今度は中折り綴じプレート43が上昇するが、一对の導入ロール39、39がワンウェイクラッチによって中折り綴じプレート43の移動に連動せずに回転しないことも相俟って、中折り中綴じ状態の用紙P2が中折り綴じプレート43とともに上昇せずにその位置に留まる。そして、図14に示すように、中折り綴じプレート43は待機位置まで上昇する。また、用紙導出部材48が待機位置から導出位置まで突出し、中折り中綴じされた用紙P2を排出方向の一对の折り付けロール51、51側に導く。

【0084】また、上記動作過程にあって、中折り綴じプレート43が待機位置の近傍まで上昇すると、図20

に示すように、揺動レバー66が再びモータ逆転スイッチSW2を押下し、交流モータ60の時計方向側端子t2に電源入力切り替えられ、交流モータ60が時計方向に逆回転する。これによって中折り綴じプレート43が待機位置で、用紙導出部材48が導出位置で共に停止される一方で、一对の導入ロール39、39及び一对の折り付けロール51、51が用紙排出方向に回転駆動される。そのため、中折り綴じされた用紙P2が一对の折り付けロール51、51の間を通して排出される。

【0085】以上、前記中折り綴じ装置31では、用紙セット台33に中折りしたい位置をスリット38の位置になるように用紙P1をセットし、スタートスイッチSW1を操作するだけで自動的に中折り綴じプレート43を待機位置から中折り綴じ位置方向に移動し、中折り綴じプレート43の先端の位置で用紙P1が中折りされつつスリット38内に挿入され、中折り綴じプレート43が中折り綴じ位置まで移動すると、中折り綴じプレート43の先端の位置で用紙P1にステープラ46によって針打ちされることから用紙P1の中折り位置と中綴じ位置とが必然的に一致し、位置決め機構を付加する必要がない。従って、中折り、中綴じの位置精度が良好で、しかも構造が簡単な中折り綴じ装置31を提供できる。

【0086】前記第2実施形態では、交流モータ60を設け、この交流モータ60の駆動力で中折り綴じプレート43が待機位置と中折り綴じ位置との間で移動するようにしたので、交流モータ43の駆動力で中折り綴じ作業ができる。従って、手動による中折り綴じ作業に比べてユーザの作業が軽減され、その結果、作業ミスの低減、処理の高速化になる。また、手動による中折り綴じ作業に較べて中折り綴じプレート43の動作が安定することから中折り綴じの品質が向上する。又、処理の高速化、不安定さが無い。

【0087】前記第2実施形態では、一对の導入ロール39、39及び一对の折り付けロール51、51は、交流モータ60の駆動力で回転するように構成したので、中折り綴じプレート43を駆動する交流モータ60によって一对の導入ロール39、39及び一对の折り付けロール51、51の駆動がなされるため、搭載するモータ数を低減できる。第2実施形態では、交流モータ60を1個のみ搭載することによって中折り綴じ装置31が作製されている。

【0088】次に、第2実施形態の中折り綴じ装置31に付設されるカウンター機構80を図21及び図22に基づいて説明する。

【0089】図21及び図22に示すように、カウンター機構80は、ステープラ46、46の残り針数を表示するものであり、支持軸64aに固定されたウォームギア81と、このウォームギア81に噛み合い、支持プレート82に回転自在に支持されたウォームホイール83と、このウォームホイール83と同軸上で、且つ、別個

独立に回転できるダイアルプレート84と、ダイアルプレート84とウォームホイール83とを所定の摩擦力で密着させるバネ板85とから構成されている。ダイアルプレート84の外周には所定間隔で目盛りが設けられており、ダイアルプレート84はウォームホイール83の回転時にはバネ板85のバネ力によって共に回転する。ウォームホイール83は、第2ギア63の回転数に比例して回転角度が決定されるため、この関係を利用してダイアルプレート84で残り針数を表示するものである。

【0090】つまり、第2ギア63は1回の針打ち動作で1回転するため、第3ギア64は第2ギア63とのギア比によって決まる回転数だけ回転する。また、第3ギア64とウォームギア81とは同じ回転数であり、ウォームホイール83はウォームギア81の1回転で1歯だけ進む。従って、第2ギア62の回転数とウォームホイール83の回転角度とが比例し、この比例関係によって残り針数を表示させることができる。例えば、針数が100、第2ギア63が60歯、第3ギアが30歯であり、100針打ったところでウォームホイール83が丁度1回転するようにするには、ウォームホイール83の歯数を200歯とすれば良い。

【0091】このカウンター機構80を搭載すれば、ユーザはステープラ46、46内の針30が無くなる前に針30の補充時期を知ることができる。

【0092】尚、一体に接続された針数の途中で折れた針30や、一体に接続された針数の途中まで使った針30を使用する場合には、その針数に対応する回転位置にユーザがダイアルプレート84をセットする。このようにすれば、一体に接続された針数の途中で折れた針30や、一体に接続された針数の途中まで使った針30を使用する場合にも残り針数を正確に表示できる。

【0093】図23はカウンター機構の変形例の概略構成図である。図23に示すように、変形例のカウンター機構90は、第2ギア63と同軸で、所定の摩擦力によって固定された第1カウンターギア91と、この第1カウンターギア91に噛み合い、マーク（マーク位置を矢印で図示）が付けられた第2カウンターギア92と、この第2カウンターギア92に近接配置され、マーク（マーク位置を矢印で図示）が付けられたマークプレート93とから構成されている。第1カウンターギア91は、ステープラ46にセットするセット針数Nより+1した歯数とし、第2カウンターギア92は、ステープラ46にセットするセット針数Nと同数の歯数に設定する。中折り綴じ動作を1回、つまり、針打ちを1回すると、第2カウンターギア92は1回転と1/N回転することになる。中折り綴じ動作をN回、つまり、針打ちをN回すると、第2カウンターギア92はN回転プラス1（=N/N）回転することになる。従って、このように構成することにより、第2カウンターギア92のマーク位置が丁度1回転した位置で停止させることができ、残り針数

を表示することができる。

【0094】尚、第2実施形態では、操作を確実にするため、用紙P1をストップ部材36に当接する位置にセットした後、ユーザがスタートスイッチSW1を押下する構成としたが、スタートスイッチSW1をストップ部材36の用紙P1が当接する位置に装着すれば、用紙P1をセットするだけで、自動的にスタートが行われる構成とすることができる。

【0095】尚、前記第2実施形態では、モータとして交流モータ60を使用したため、自動の中折り綴じ装置31の電気系を安価に作製できるが、交流モータ60以外で作製しても良いことは勿論である。

【0096】尚、前記第1及び第2実施形態によれば、用紙P1の丁度中間位置で中折り中綴じを行う場合を説明したが、用紙P1の丁度中間位置以外で中折り中綴じする場合にも同様に適用できる。また、ステープラ20、46は2箇所にはけられ、用紙P1の2箇所に針30を打つ場合を説明したが、ステープラ20、46の個数は1個でも3個以上でも良いことは勿論である。

【0097】

【発明の効果】以上説明したように、請求項1の発明によれば、用紙セット台に中折りしたい位置をスリット位置になるように用紙をセットし、中折り綴じプレートを待機位置から中折り綴じ位置方向に移動すると、中折り綴じプレートの先端の位置で用紙が中折りされつつスリット内に挿入され、中折り綴じプレートが中折り綴じ位置まで移動すると、中折り綴じプレートの先端の位置で用紙にステープラによって針打ちされるため、用紙の中折り位置と中綴じ位置とが必然的に一致し、位置決め機構を付加する必要がない。従って、中折り、中綴じの位置精度が良好で、しかも構造が簡単である。

【0098】請求項2の発明によれば、手動でハンドルを操作して中折り綴じ操作ができるため、より構造が簡単で、コスト安にできる。

【0099】請求項3の発明によれば、モータの駆動力で中折り綴じ操作ができるため、手動による中折り綴じ作業に比べユーザの作業が軽減され、その結果、ミスの低減、処理の高速化になる。また、手動による中折り綴じ作業に比べて中折り綴じプレートの動作が安定することから中折り綴じの品質が向上する。さらに、処理の高速化、不安定さがない。

【0100】請求項4の発明によれば、中折り綴じプレートの移動によって複数の用紙がスリット内に挿入される過程で、複数の用紙が一对の導入ロールの回転によりスムーズに移動されるため、用紙に極力ダメージを与えることなく中折り動作を行うことができる。

【0101】請求項5の発明によれば、複数の用紙の全体の厚みに応じて一对の導入ロール間が可変し、且つ、付勢手段によって所定の挟持力を作用させるため、種々の全体厚みの用紙に対して中折りを行うことができる。

【0102】請求項6の発明によれば、用紙が中折り綴じプレートに押圧されて中折りされる際に、一对の導入ロールが用紙を共に送り込むため、用紙の中折りがスムーズに行われる。

【0103】請求項7の発明によれば、一对の導入ロールの駆動を別途行う必要がないため、使い勝手が良い。

【0104】請求項8の発明によれば、中折り綴じプレートを駆動するモータによって一对の導入ロールの駆動がなされるため、搭載するモータ数を低減できる。

【0105】請求項9の発明によれば、中折り綴じされた用紙が取りやすい位置まで排出されるため、ユーザの使い勝手が良い。

【0106】請求項10の発明によれば、中折り綴じされた用紙がより取りやすい位置まで排出されると共に良好な中折りがなされるため、使い勝手が非常に良い。

【0107】請求項11の発明によれば、用紙導出部材の駆動を別途行う必要がないため、使い勝手が良い。

【0108】請求項12の発明によれば、一对の折り付けロールの回転駆動を別途行う必要がないため、使い勝手が良い。

【0109】請求項13の発明によれば、中折り綴じプレートを駆動するモータ、又は、これに加えて一对の導入ロールを駆動するモータによって一对の折り付けロールの駆動がなされるため、搭載するモータ数を低減できる。

【図面の簡単な説明】

【図1】本発明の第1実施形態を示し、中折り綴じ装置の斜視図である。

【図2】本発明の第1実施形態を示し、中折り綴じ装置の概略構成図である。

【図3】本発明の第1実施形態を示し、中折り綴じ装置の要部の斜視図である。

【図4】本発明の第1実施形態を示し、用紙セット台に複数の用紙がセットされた状態を示す概略構成図である。

【図5】本発明の第1実施形態を示し、中折り綴じプレートが中折り綴じ位置に位置する状態を示す概略構成図である。

【図6】本発明の第1実施形態を示し、中折り綴じプレートが中折り綴じ位置から待機位置に戻された状態を示す概略構成図である。

【図7】本発明の第2実施形態を示し、中折り綴じ装置の斜視図である。

【図8】本発明の第2実施形態を示し、中折り綴じプレートが待機位置に位置し、用紙セット台に複数の用紙がセットされた状態の中折り綴じ装置の概略構成図である。

【図9】本発明の第2実施形態を示し、中折り綴じ駆動機構の中折り綴じ駆動系の要部の正面図である。

【図10】本発明の第2実施形態を示し、中折り綴じ駆

動機構の中折り綴じ駆動系の平面図である。

【図11】本発明の第2実施形態を示し、中折り綴じ機構の用紙排出系の要部の正面図である。

【図12】本発明の第2実施形態を示し、中折り綴じ機構の用紙排出系の平面図である。

【図13】本発明の第2実施形態を示し、中折り綴じプレートが中折り綴じ位置に位置する中折り綴じ装置の概略構成図である。

【図14】本発明の第2実施形態を示し、中折り綴じプレートが中折り綴じ位置から待機位置に戻される途中であって、用紙導出部材が中折り綴じされた用紙を排出側に導いている状態の中折り綴じ装置の概略構成図である。

【図15】本発明の第2実施形態を示し、中折り綴じプレートが中折り綴じ位置から待機位置に戻された状態の中折り綴じ装置の概略構成図である。

【図16】本発明の第2実施形態を示し、中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図である。

【図17】本発明の第2実施形態を示し、中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図である。

【図18】本発明の第2実施形態を示し、中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図である。

【図19】本発明の第2実施形態を示し、中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図である。

【図20】本発明の第2実施形態を示し、中折り綴じ動作の各過程のスイッチ位置を示す中折り綴じ駆動機構の回路図である。

【図21】本発明の第2実施形態を示し、カウンター機構の平面図である。

【図22】本発明の第2実施形態を示し、カウンター機構の正面図である。

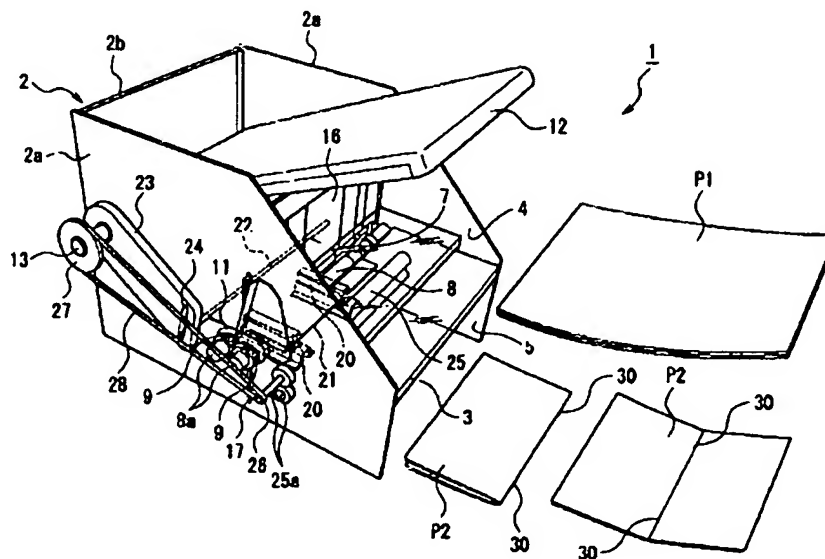
【図23】本発明の第2実施形態のカウンター機構の変形例であって、そのカウンター機構の概略構成図である。

【図24】従来例の中折り綴じ装置の概略構成図である。

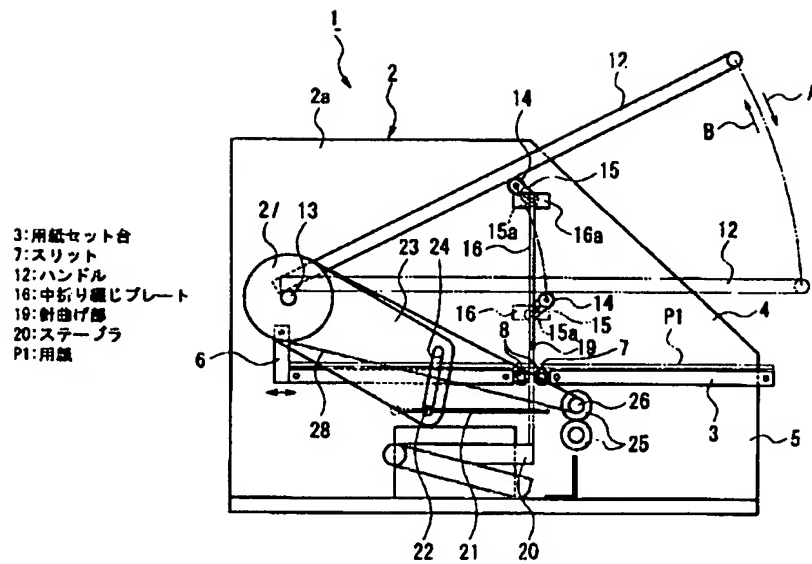
【符号の説明】

- 1, 31 中折り綴じ装置
- 3, 33 用紙セット台
- 7, 38 スリット
- 8, 8, 39, 39 一對の導入ロール
- 11, 41 バネ（付勢手段）
- 12 ハンドル
- 16, 43 中折り綴じプレート
- 19 針曲げ部
- 20, 46 ステープラ
- 21, 48 用紙導出部材
- 25, 25, 51, 51 一對の折り付けロール
- 60 交流モータ（モータ）
- P1 単に重畳された用紙
- P2 中折り中綴じされた用紙

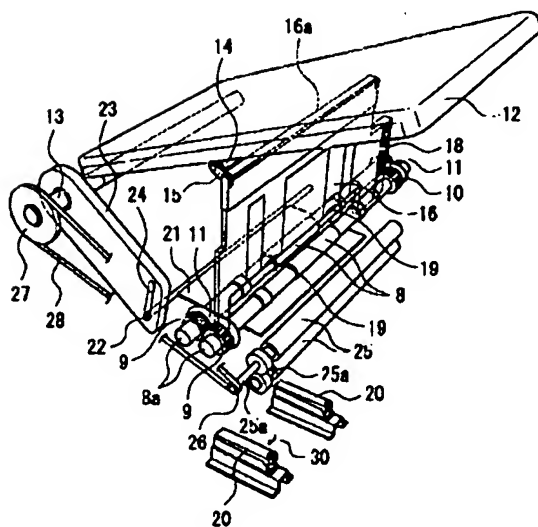
【図1】



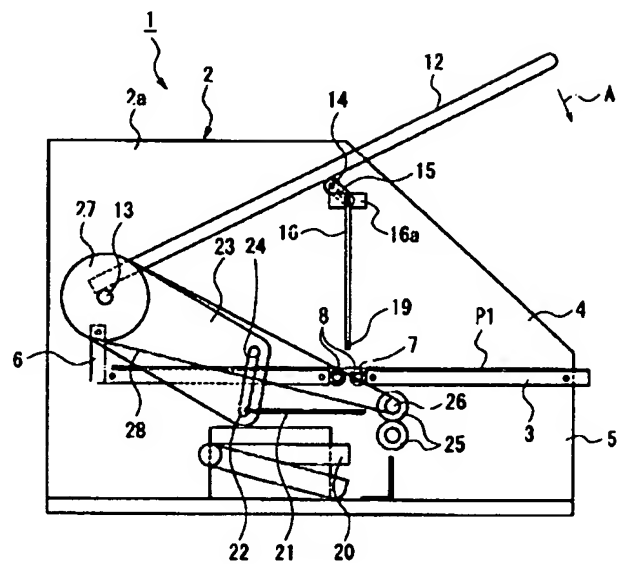
【図2】



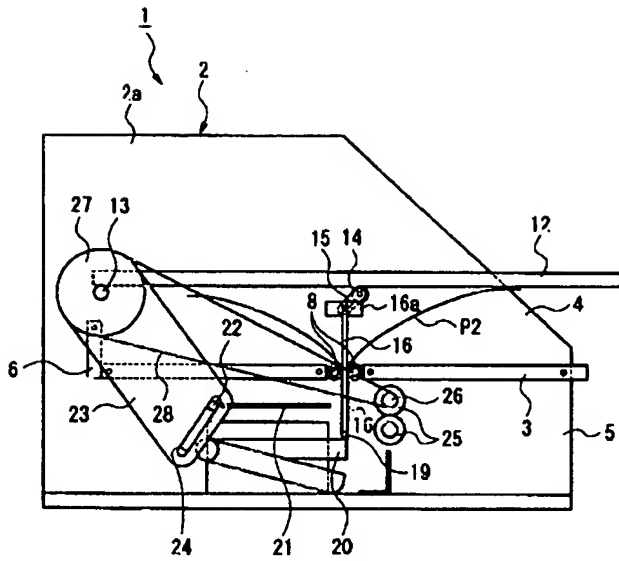
【図3】



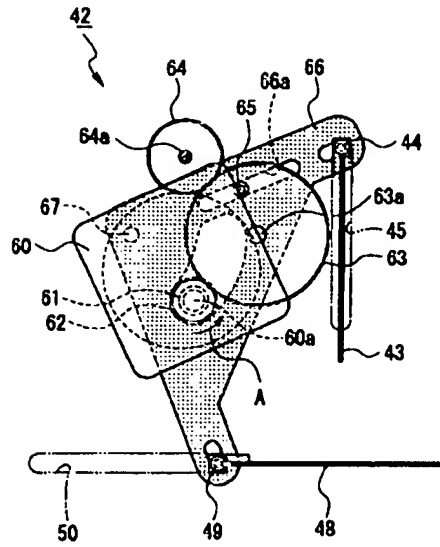
【図4】



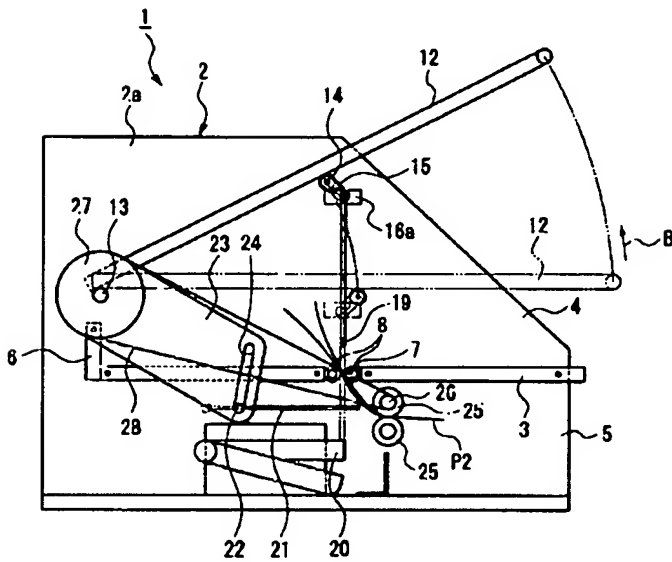
【図5】



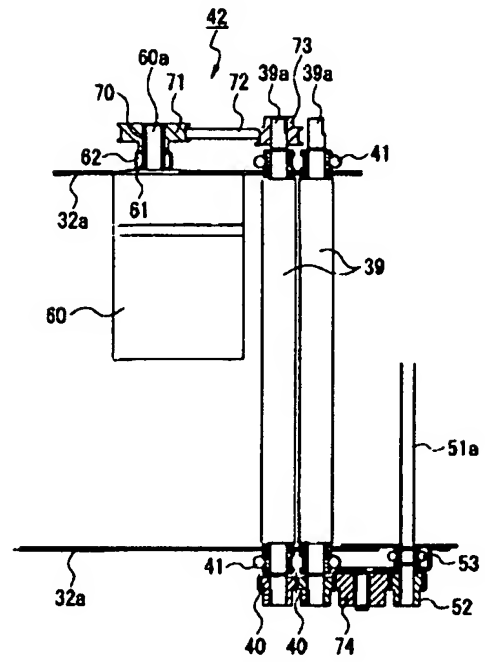
【図9】



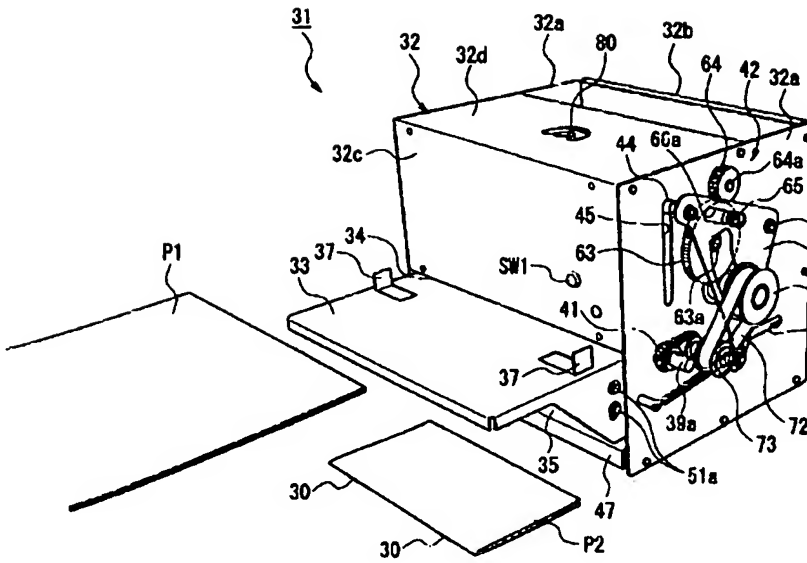
【図6】



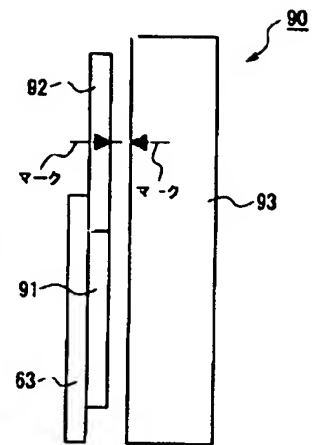
【図12】



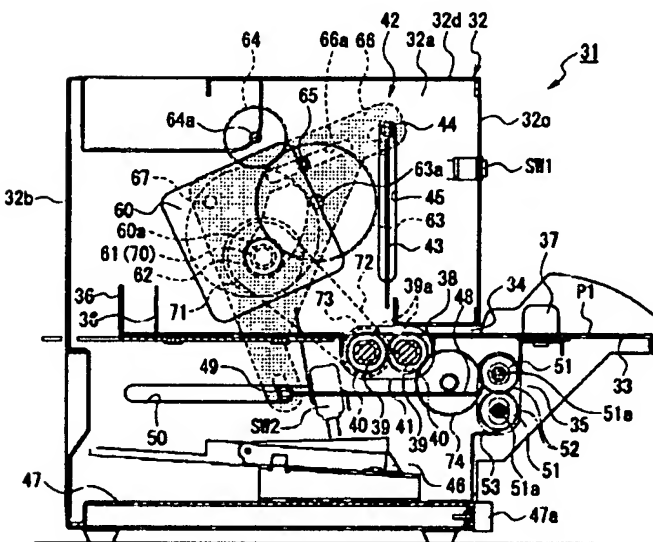
【図7】



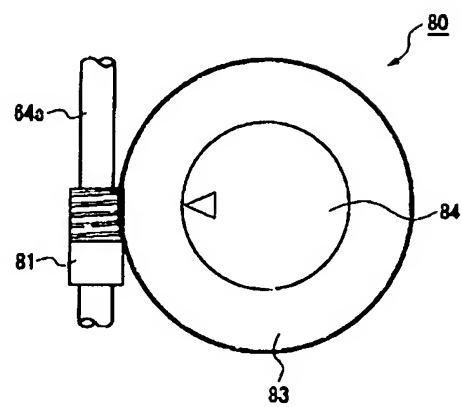
【図23】



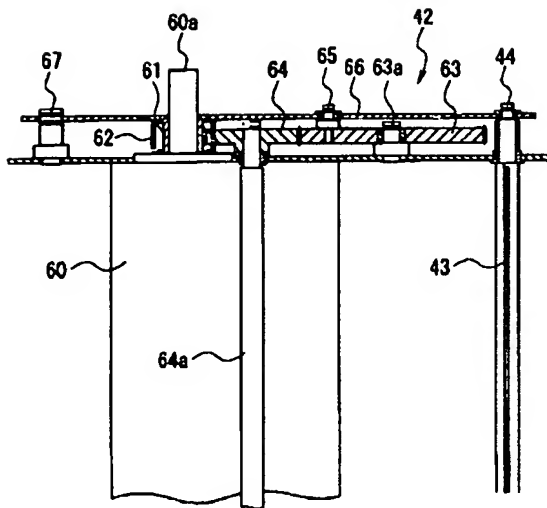
【図8】



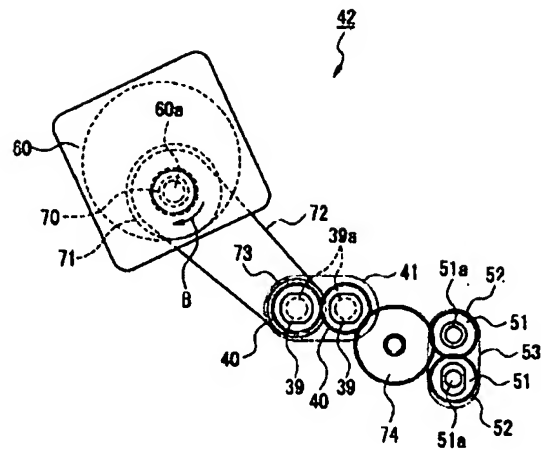
【図21】



【図10】

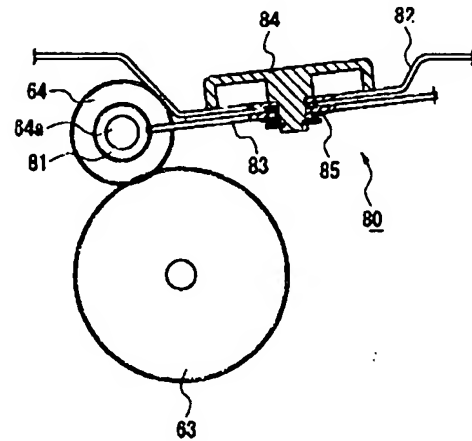
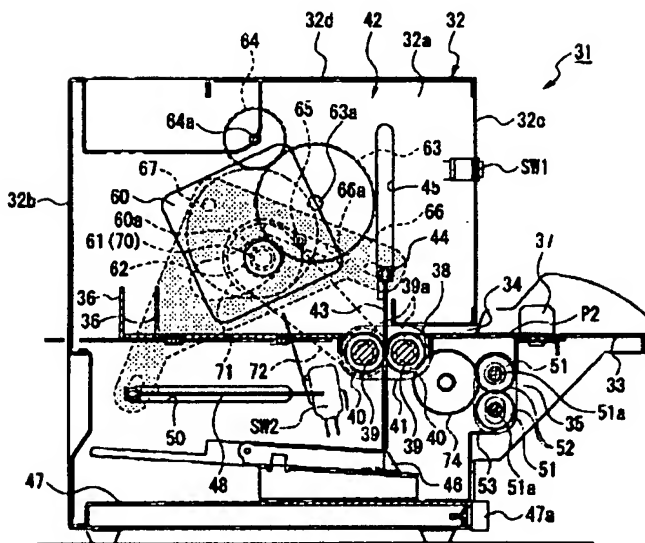


【図11】

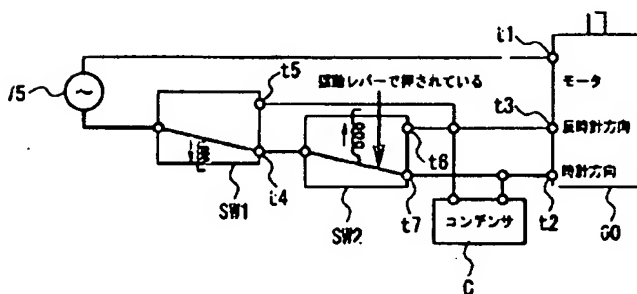


【図22】

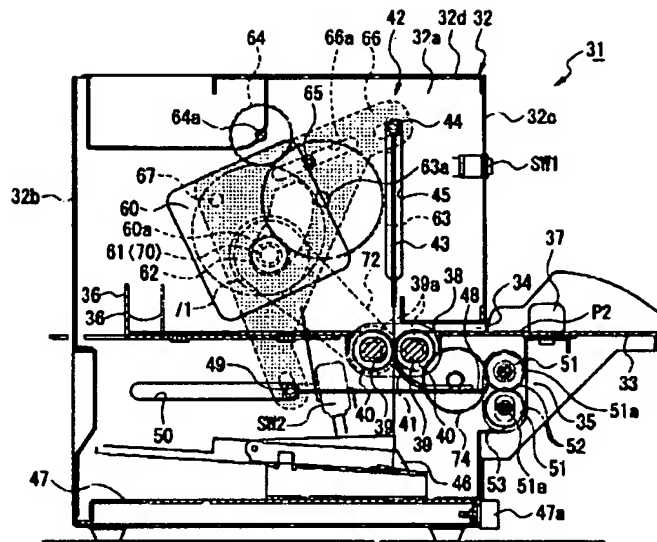
【図13】



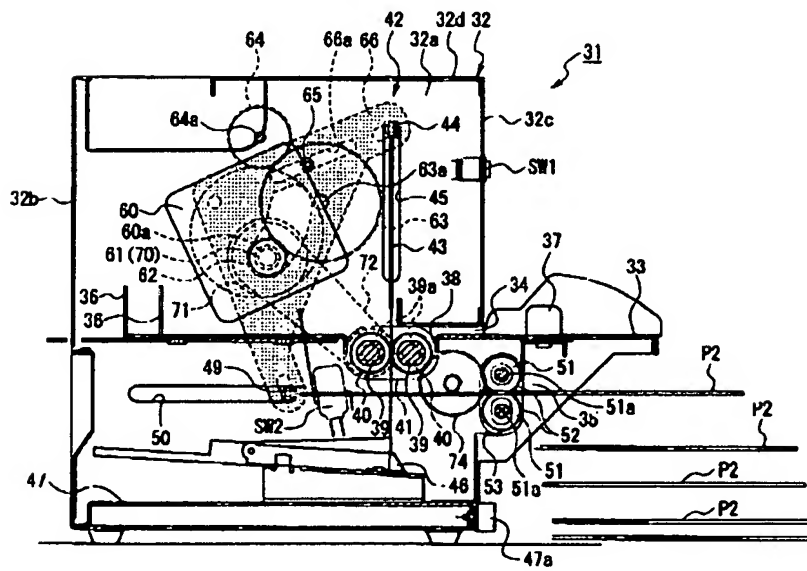
【図16】



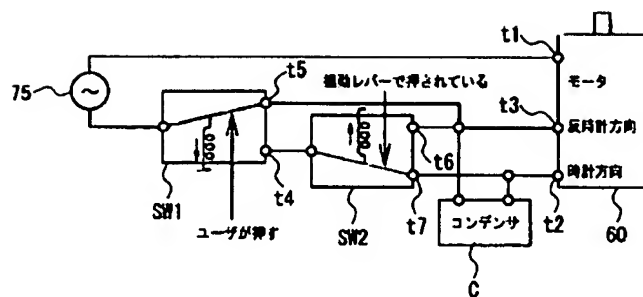
【図14】



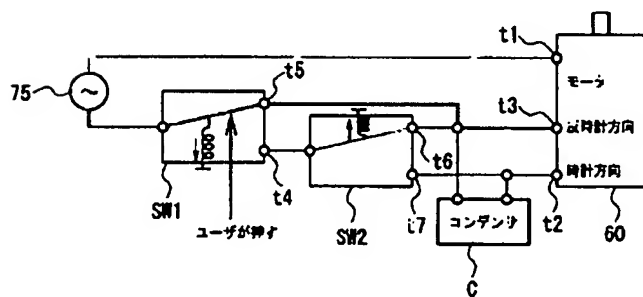
【図15】



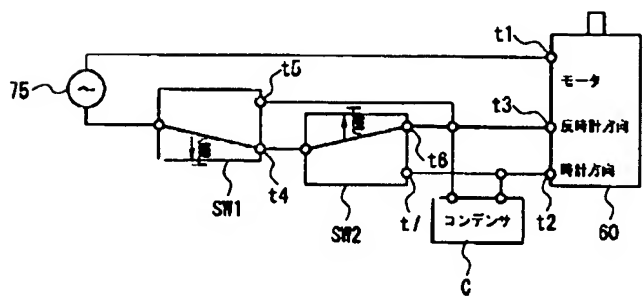
【図17】



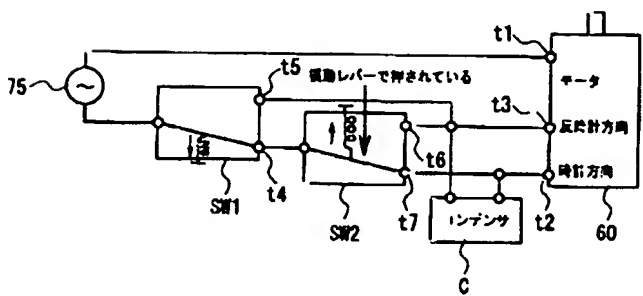
【図18】



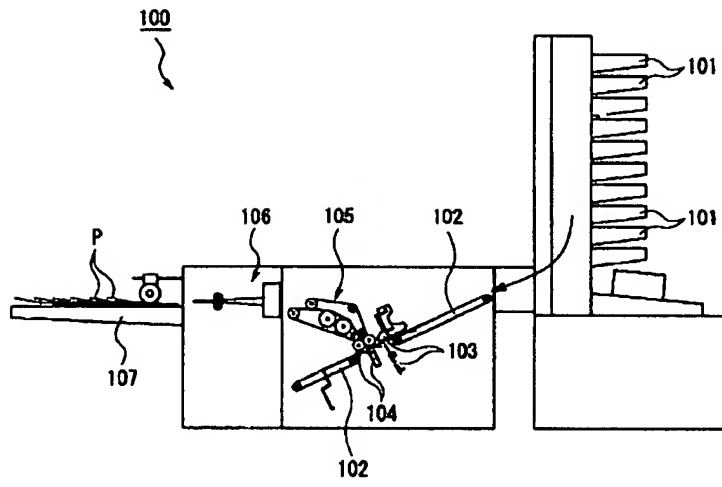
【図19】



【図20】



【図24】



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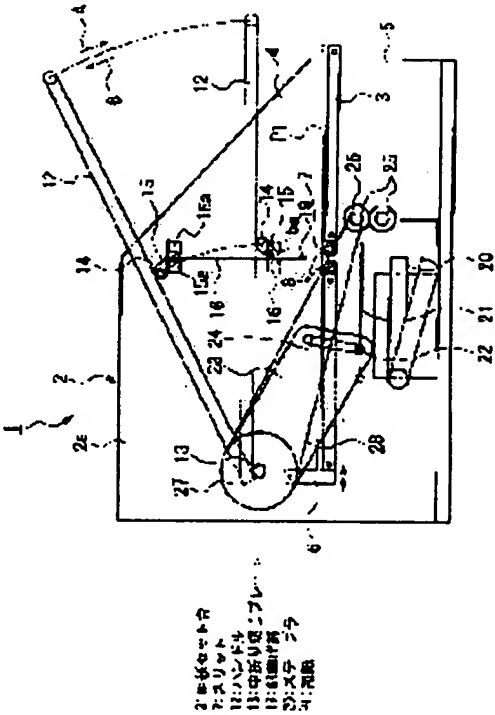
Priority number : 2001172880 Priority date : 07.06.2001 Priority country : JP

(54) MIDDLE FOLDING STITCHING APPARATUS

(57)Abstract:

PROBLEM TO BE SOLVED: To improve positioning of middle folding and saddle stitching and simplify the apparatus in structure.

SOLUTION: This apparatus is provided with a paper setting table 3 having a slit 7 for setting a plurality of sheets of stacked paper P1, a middle folding stitching plate 16 which is movably mounted between a waiting position not entering the slit 7 of the paper setting table 3 and a middle folding and stitching position entering the slit 7 and comprises a staple bending part 19 at an entering tip of the slit 7, and a stapler 20 for stapling the paper P1 through which the middle folding stitching plate 16 is in pressure contact with the stapler 20 in a position of middle folding and stitching. In cooperation with operation of a handle 12 the middle folding and stitching plate 16 moves between the waiting position and the middle folding and stitching position.



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examiner's decision of rejection or application
converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of
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[Date of requesting appeal against examiner's
decision of rejection]
[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The form set base where a form is set to the top-face side where a slit is prepared and opening of this slit is carried out, A chip box binding plate while are prepared free [migration] between chip box binding locations while advancing into the position in readiness and this slit which do not advance into said slit of this form set base, and having the needle bending section at the tip of penetration of said slit, Chip box binding equipment while an inside [this] chip box binding plate carries out a pressure welding through said form in the condition of being located in an inside chip box binding location and characterized by having the stapler which ***** in said form.

[Claim 2] Chip box binding equipment while being characterized by being inside chip box binding equipment according to claim 1, preparing an operational handle manually, and actuation of this handle being interlocked with, and making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location.

[Claim 3] Chip box binding equipment while being characterized by being inside chip box binding equipment according to claim 1, forming a motor, and making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location with the driving force of this motor.

[Claim 4] Chip box binding equipment while being characterized by being inside chip box binding equipment according to claim 1 to 3, forming the introductory roll of a pair in said slit, and making it said inside chip box binding plate advance with said form between the introductory rolls of this pair.

[Claim 5] While being characterized by being energized by the energization means in the direction which it is inside chip box binding equipment according to claim 4, and the introductory roll of said pair is freely movable in the direction of disjunction, and contacts, it is chip box binding equipment.

[Claim 6] While being inside chip box binding equipment according to claim 4 or 5 and being characterized by the introductory roll of said pair rotating in the direction to which both the forms that broke inside and were carried out on the occasion of the migration in an inside chip box binding location from the position in readiness of an inside chip box binding plate are moved, it is chip box binding equipment.

[Claim 7] While being inside chip box binding equipment according to claim 6 and being characterized by interlocking with [actuation / of said handle] the introductory roll of said pair in case said inside chip box binding plate goes to an inside chip box binding location from a position in readiness, and rotating it, it is chip box binding equipment.

[Claim 8] While being inside chip box binding equipment according to claim 6 and being characterized by the introductory roll of said pair rotating with the driving force of said motor, it is chip box binding equipment.

[Claim 9] Chip box binding equipment while being characterized by preparing the form derivation member which is inside chip box binding equipment according to claim 1 to 8, and leads said form by which inside chip box binding was carried out to an eject direction in case said inside chip box binding plate returns from an inside chip box binding location to a position in readiness.

[Claim 10] Chip box binding equipment while being characterized by moving said form which it was inside chip box binding equipment according to claim 9, and the pair broke into the location to which said form is led by said form derivation member, the roll was formed in it, and this pair broke, and advanced between rolls to an eject direction by rotation.

[Claim 11] While being inside chip box binding equipment according to claim 9 or 10 and being characterized by for said form derivation member interlocking and moving it to actuation of said handle and said inside chip box binding plate, in case said inside chip box binding plate returns from an inside chip box binding location to a position in

readiness, it is chip box binding equipment.

[Claim 12] While being inside chip box binding equipment according to claim 10 or 11, and said pair's breaking and being characterized by interlocking with [actuation / of said handle] a roll and rotating it, it is chip box binding equipment.

[Claim 13] While being characterized by being inside chip box binding equipment according to claim 10 or 11, for said pair breaking, and a roll rotating with the driving force of said motor, it is chip box binding equipment.

[Translation done.]

NOTICES *

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- 2.**** shows the word which can not be translated.
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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] The form with which it was superimposed on plurality (laminating) is folded inside, and this invention carries out it, and while filing with a pointer stop in this location which carried out the inside chip box, it relates to chip box binding equipment.

[0002]

[Description of the Prior Art] There are some which are shown in drawing 24 as this kind of inside chip box binding equipment of the former. As shown in drawing 24, inside chip box binding equipment 100 Two or more feed bases 101 in which the form with which it has been arranged in the vertical direction and superimposed on plurality is laid, respectively, A form feeding means which is not illustrated to feed paper to two or more forms set to this feed base 101, A form conveyance means 102 to convey two or more forms to which paper was fed by this form feeding means in a ***** location and an inside binding location, respectively, and to set them to them, The needle drummer stage 103 which strikes a needle (the so-called staple) to two or more forms set to the ***** location with this form conveyance means 102, The chip box means 104 while folding two or more forms set to the inside binding location inside and carrying out them with said form conveyance means 102, A form discharge means 105 to move two or more forms which broke inside with the inside [this] chip box means 104, and were carried out to an eject direction, It has the delivery base 107 in which the form P which filed during the chip box and was carried out while being discharged by the trimer means 106 which carries out tree MINGU of the form P which is conveyed by this form discharge means 105, and by which inside chip box binding was carried out, and this trimer means 106 is laid.

[0003] In the above-mentioned configuration, two or more forms set to the feed base 101 are conveyed by the form conveyance means 102 through a form feeding means, and two or more forms are set to a ***** location with this form conveyance means 102. The needle drummer stage 103 strikes a needle to two or more forms set to this ***** location, a needle is struck by the ***** location of a request of two or more forms by this, and it is filed.

[0004] Next, two or more forms are set to an inside chip box location by the form conveyance means 102. The inside chip box means 104 performs an inside chip box to two or more forms set to the inside [this] chip box location, and two or more forms by this break inside, and are carried out in a ***** location. The form P which filed during the inside chip box and was carried out is conveyed by the form discharge means 105, is led to the trimer means 106, and after tree MINGU is carried out with the trimer means 106, it is delivered to the delivery base 107.

[0005]

[Problem(s) to be Solved by the Invention] However, the form P which is a good inside chip box when it is necessary to perform alignment so that the ***** location where the needle drummer stage 103 makes ***** a form, and a chip box location while the inside chip box means 104 makes an inside chip box a form may turn into the same location, and both locations shift with said inside chip box binding equipment 100 of the former, and was filed inside cannot be obtained. In order to obtain the form P which was a good inside chip box, and filed inside and was carried out, an alignment device is required, and there was a problem of structure being complicated.

[0006] Then, this invention is made that the above mentioned technical problem should be solved, and is folded inside, and the location precision of inside binding is good and, moreover, it aims at offering inside chip box binding equipment with easy structure.

[0007]

[Means for Solving the Problem] The form set base where a form is set to the top-face side where, as for invention of claim 1, a slit is prepared, and opening of this slit is carried out, A chip box binding plate while are prepared free [migration] between chip box binding locations while advancing into the position in readiness and this slit which do not advance into said slit of this form set base, and having the needle bending section at the tip of penetration of said slit, An inside [this] chip box binding plate carries out a pressure welding through said form in the condition of being located in an inside chip box binding location, and it is characterized by having the stapler which ***** in said form.

[0008] If a form is set so that it may become a slit location about a location to break into a form set base by inside [this] chip box binding equipment inside, and carry out, and an inside chip box binding plate is moved in the inside chip box binding location direction from a position in readiness If it is inserted into a slit and an inside chip box binding plate moves to an inside chip box binding location, a form breaking inside and being carried out in the location at the tip of an inside chip box binding plate Since a form ***** with a stapler in the location at the tip of an inside chip box binding plate, the inside chip box location of a form and an inside binding location are inevitably in agreement, and do not need to add a positioning device.

[0009] Invention of claim 2 is inside chip box binding equipment according to claim 1, and is characterized by preparing an operational handle manually, and actuation of this handle being interlocked with, and making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location.

[0010] In addition to an operation of invention of claim 1, with inside [this] chip box binding equipment, inside chip box binding actuation can be performed with a user's hand control.

[0011] Invention of claim 3 is inside chip box binding equipment according to claim 1, forms a motor and is characterized by making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location with the driving force of this motor.

[0012] In addition to an operation of invention of claim 1, with inside [this] chip box binding equipment, inside chip box binding actuation can be performed with the driving force of a motor.

[0013] Invention of claim 4 is inside chip box binding equipment according to claim 1 to 3, forms the introductory roll of a pair in said slit, and is characterized by making it said inside chip box binding plate advance with said form between the introductory rolls of this pair.

[0014] In addition to an operation of invention of claim 1 - claim 3, in inside [this] chip box binding equipment, two or more forms are smoothly moved by rotation of the introductory roll of a pair in the process in which two or more forms are inserted by migration of an inside chip box binding plate into a slit.

[0015] Invention of claim 5 is inside chip box binding equipment according to claim 4, and the introductory roll of said pair is characterized by being energized by the energization means in the direction which can move in the direction of disjunction freely, and contacts.

[0016] According to the thickness of two or more whole forms, between the introductory rolls of a pair carries out adjustable, and the predetermined pinching force is made to act with an energization means with inside [this] chip box binding equipment in addition to an operation of invention of claim 4.

[0017] Invention of claim 6 is inside chip box binding equipment according to claim 4 or 5, and the introductory roll of said pair is characterized by rotating in the direction to which both the forms that broke inside and were carried out are moved on the occasion of the migration in an inside chip box binding location from the position in readiness of an inside chip box binding plate.

[0018] With inside [this] chip box binding equipment, in addition to an operation of invention of claim 4 or claim 5, a form is pressed by the inside chip box binding plate, and in case it breaks inside and is carried out, the introductory roll of a pair sends in both forms.

[0019] Invention of claim 7 is inside chip box binding equipment according to claim 6, and the introductory roll of said pair is characterized by for actuation of said handle being interlocked with and rotating, in case said inside chip box binding plate goes to an inside chip box binding location from a position in readiness.

[0020] In addition to an operation of invention of claim 6, it is not necessary to drive the introductory roll of a pair separately with inside [this] chip box binding equipment.

[0021] Invention of claim 8 is inside chip box binding equipment according to claim 6, and the introductory roll of said pair is characterized by rotating with the driving force of said motor.

[0022] In addition to invention of claim 6, with inside [this] chip box binding equipment, the drive of the introductory roll of a pair is made by the motor which drives an inside chip box binding plate.

[0023] Invention of claim 9 is inside chip box binding equipment according to claim 1 to 8, and in case said inside chip box binding plate returns from an inside chip box binding location to a position in readiness, it is characterized by preparing the form derivation member which leads said form by which inside chip box binding was carried out to an eject direction.

[0024] In addition to an operation of invention of claim 1 - claim 8, with inside [this] chip box binding equipment, it is discharged to the location which the form by which inside chip box binding was carried out tends to take.

[0025] Invention of claim 10 is inside chip box binding equipment according to claim 9, and is characterized by moving said form which the pair broke into the location to which said form is led by said form derivation member, the roll was formed, and this pair broke, and advanced between rolls to an eject direction by rotation.

[0026] With inside [this] chip box binding equipment, while the form by which inside chip box binding was carried out is discharged to choice or a cone location in addition to an operation of invention of claim 9, a good inside chip box is made.

[0027] Invention of claim 11 is inside chip box binding equipment according to claim 9 or 10, and said form derivation member is characterized by interlocking and moving to actuation of said handle, in case said inside chip box binding plate returns from an inside chip box binding location to a position in readiness.

[0028] In addition to an operation of invention of claim 9 or claim 10, it is not necessary to drive a form derivation member separately with inside [this] chip box binding equipment.

[0029] Invention of claim 12 is inside chip box binding equipment according to claim 10 or 11, said pair breaks and a roll is characterized by for actuation of said handle being interlocked with and rotating.

[0030] In addition to an operation of invention of claim 10 or claim 11, a pair breaks by inside [this] chip box binding equipment, and it is not necessary to perform the rotation drive of a roll separately.

[0031] Invention of claim 13 is inside chip box binding equipment according to claim 10 or 11, and it is characterized by for said pair breaking and a roll rotating with the driving force of said motor.

[0032] In addition to invention of claim 10 or claim 11, by the motor which drives an inside chip box binding plate, or the motor which drives the introductory roll of a pair in addition to this, a pair breaks and the drive of a roll is made with inside [this] chip box binding equipment.

[0033]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained based on a drawing.

[0034] Drawing 1 - drawing 6 show the 1st operation gestalt of this invention. Drawing 1 The perspective view of inside chip box binding equipment, The outline block diagram of inside chip box binding equipment and drawing 3 drawing 2 The perspective view of the important section of inside chip box binding equipment, The outline block diagram with which drawing 4 shows the condition that two or more forms were set to a form set base, the outline block diagram in which an inside chip box binding plate shows the condition that drawing 5 is located in an inside chip box binding location, and drawing 6 are the outline block diagrams showing the condition that the inside chip box binding plate was returned to the position in readiness from the inside chip box binding location.

[0035] As shown in drawing 1 - drawing 3 , the case 2 of inside chip box binding equipment 1 has the side plates 2a and 2a of the pair which kept fixed spacing and was set up in parallel, and backplate 2b which really connects between side plate 2a of this pair, and 2a behind. Between side plate 2a of a pair, and 2a, the form set base 3 arranged horizontally is being fixed, and the upper part tooth space of this form set base 3 is made into the feed tooth space 4, and let the lower part tooth space of this form set base 3 be the delivery tooth space 5. The form P1 with which it was superimposed on plurality from the front on the form set base 3 (laminating) is set, and the form P2 which filed during the inside chip box binding was carried out from the front of the lower part of the form set base 3 is taken out.

[0036] Moreover, the stopper member 6 is formed behind the form set base 3, and a form P1 can be easily set now to the position on the form set base 3 by this stopper member 6. Namely, the location which wants to carry out inside chip box binding of two or more forms P1 can be set now according to a slit location by making two or more forms P1 advance until it runs against the stopper member 6. Moreover, the stopper member 6 can be positioned now in a proper location, and, thereby, can make free adjustable [of the migration of an inside chip box binding location to the cross direction of the form set base 3] now to a desired location about the form P1 of various sizes. Furthermore, the slit 7 was formed in the center of abbreviation of the form set base 3, and this slit 7 is prolonged in the longitudinal direction, and it is prepared in the long dimension rather than the width of face of the form P1 which files during an inside chip box binding and is carried out at least.

[0037] As shown in drawing 2, in the slit 7, the introductory rolls 8 and 8 of a pair are formed free [rotation], and the gear 9 which meshes mutually is being fixed to the end side of pivot 8a of each of this introductory roll 8, respectively. As shown in drawing 3, while a pinion 10 is fixed to the other end side of pivot 8a of one introductory roll 8 and this pinion 10 mentions later, it has geared on the rack 18 of the chip box binding plate 16. That is, the introductory rolls 8 and 8 of a pair are interlocked with the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 16, and rotate the form P1 which broke inside and was carried out in the direction to which it moves with the inside chip box binding plate 16. Moreover, the introductory rolls 8 and 8 of a pair are energized with the spring 11 which is an energization means in the direction which can move in the direction of disjunction freely mutually, holding engagement of a gear 9, and contacts. Furthermore, the one-way clutch which is not illustrated intervenes between each introductory roll 8 and each pivot 8a, the rotation of a direction each introductory roll 8 makes [rotation] a form P1 advance [rotation] into a slit 7 is transmitted from each pivot 8a, and rotation of the opposite direction is made into transfer impossible.

[0038] As shown in drawing 1 - drawing 3, between side plate 2a of a pair, and 2a, a handle 12 is supported free [rotation] through a pivot 13 in the end face side, and it is prepared by arranging the tip side above the form set base 3 so that a user can operate it manually. Actuation of this handle 12 is delivery actuation of the direction of arrow-head A of drawing 2, and return actuation of the direction of arrow-head B of drawing 2. Moreover, it is supported by the lower part of the mid-position of a handle 12 free [rotation of the press roll 14], and this press roll 14 is contacted on press operation section 16a of the inside chip box binding plate 16.

[0039] The inside chip box binding plate 16 is the upper part location of the form set base 3, and is arranged in the upper part location corresponding to the location of the slit 7 of the form set base 3. It was inserted in the guide hole 17 shown in drawing 1 prepared in the side plates 2a and 2a of a pair, respectively for the right-and-left both ends [a part of] of the inside chip box binding plate 16, and this guide hole 17 is prolonged in the vertical direction. Moreover, press operation section 16a is being fixed to the upper limit of the inside chip box binding plate 16. This press operation section 16a and the member which supports the press roll 14 of a handle 12 are connected through the connection member 15, and it holds connection by being connected through long hole 15a, carrying out adjustable [of some link length] between press operation section 16a and the connection member 15. And the inside chip box binding plate 16 is moved between the position in readiness shown as a continuous line in drawing 2 which is interlocked with actuation of a handle 12 and does not advance into the slit 7 of the form set base 3, and a chip box binding location while an imaginary line shows in drawing 2 which advances into the slit 7 of the form set base 3.

[0040] Furthermore, the rack 18 was formed in the part projected from side plate 2a by the side of the end of the inside chip box binding plate 16, and as this rack 18 described above, it has geared to the pinion 10 of the introductory rolls 8 and 8 of a pair. And the introductory rolls 8 and 8 of a pair rotate on the occasion of the migration in an inside chip box binding location from the position in readiness of one inside chip box binding plate 16. That is, the introductory rolls 8 and 8 of a pair are also interlocked with delivery actuation of a handle 12, and rotate.

[0041] Moreover, it is the lower limit of the inside chip box binding plate 16, i.e., the penetration tip of a slit 7, and the needle bending section 19 is formed in the location corresponding to the staplers 20 and 20 of a pair, respectively. It is fixed to the lower part location of the slit 7 of the form set base 3, and each of this stapler 20 is arranged so that the U-shaped needle (the so-called staple) 30 may be struck toward the upper part. Moreover, while being located in an inside chip box binding location, the pressure welding of each stapler 20 is carried out through a form P1 to the chip box binding plate 16, and it is set up so that a needle 30 may be struck with this contact pressure to a form P1.

[0042] As shown in drawing 1 - drawing 3, the form derivation member 21 is formed in the lower part location of the form set base 3 between side plate 2a of a pair, and 2a horizontally free [a slide]. The support pin 22 of this form derivation member 21 engages with the cam hole 24 of the rocking plate 23 fixed to the pivot 13 of a handle 12, is interlocked with rotation actuation of a handle 12, and is moved. that is, the inside chip box binding plate 16 in the bottom location of the handle 12 made into an inside chip box binding location Leave from the lower part location of a slit 7, and penetration of a form P1 is permitted. It is located in the position in readiness which shows a form P1 by the imaginary line in drawing 2 which is not led to an eject direction, and is located in the derivation location shown as a continuous line in drawing 2 which projects from the lower part location of a slit 7, and leads a form P2 to an eject direction in the upper location of the handle 12 which makes the inside chip box binding plate 16 a position in readiness.

[0043] Moreover, a pair breaks into the location to which the form P2 which was the lower part location of the form set

base 3 between side plate 2a of a pair and 2a, and filed during the inside chip box and was carried out by the form derivation member 21 is led, and rolls 25 and 25 are formed in it. This pair breaks, a pulley 26 is formed in one pivot 25a of rolls 25 and 25, and the belt 28 is hung between this pulley 26 and the pulley 27 fixed to the pivot 13 of a handle 12. The one-way clutch which is not illustrated intervenes between each chip box attachment roll 25 and each pivot 25a, only rotation of the hand of cut which moves the form P2 which filed during the inside chip box and was carried out to an eject direction breaks from each pivot 25a, and the transfer of it on a roll 25 is attained. That is, if rotation actuation of the handle 12 is carried out from a bottom location in an upper location, a pair breaks through a belt 28 and this rotation is transmitted to rolls 25 and 25, and it will rotate in order to move the form P2 with which this pair broke and rolls 25 and 25 were pinched to an eject direction.

[0044] Next, inside chip box binding actuation of inside chip box binding equipment 1 is explained. the time of the stopper member 6 laying the form P1 of predetermined size in the form set base 3 so that the stopper member 6 may be contacted when the case of the form P1 of predetermined size where break inside and carry out exactly in the mid-position, and filed inside and it carried out was explained to the example -- a form P1 -- it justifies so that the mid-position may turn into a location of a slit 7 exactly.

[0045] If a user inserts the form P1 with which it was superimposed on plurality on the form set base 3, and it sets to the location where the insertion apical surface of a form P1 contacts the stopper member 6, next delivery actuation of the handle 12 is carried out in the direction of arrow-head A of drawing 4 as shown in drawing 4 If the inside chip box binding plate 16 of a position in readiness descends from the upper part of a form P1, contacts a form P1 and carries out delivery actuation of the handle 12 more nearly further than this condition It is inserted in the slit 7 of the form set base 3 with the inside chip box binding plate 16, a form P1 being bent with the inside chip box binding plate 16 in the contact location.

[0046] Moreover, the introductory rolls 8 and 8 of a pair rotate in the direction to which a form P1 is moved with the inside chip box binding plate 16, and a form P1 is smoothly inserted by descent of the inside chip box binding plate 16 into a slit 7. Moreover, migration of the form P1 with which the form derivation member 21 leaves from the derivation location which is a lower part location of a slit 7, and is inserted by delivery actuation of a handle 12 in connection with the inside chip box binding plate 16 and this is permitted.

[0047] And a user will suspend delivery actuation of a handle 12, if the inside chip box binding plate 16 arrives at an inside chip box binding location. If the inside chip box binding plate 16 descends to an inside chip box binding location as shown in drawing 5, the pressure welding of the needle bending section 19 of the inside chip box binding plate 16 will be carried out to the staplers 20 and 20 of a pair through a form P1. The tip of a needle 30 where each stapler 20 performed ***** and was struck with this contact pressure by the form P1 is bent in the needle bending section 19. It becomes the form P2 which the form P1 with which it was superimposed on plurality broke inside, and was carried out now, and filed inside and was carried out.

[0048] Next, although return actuation of this handle 12 will be interlocked with and the inside chip box binding plate 16 will go up if a user does return actuation of the handle 12 in the direction of arrow-head B of drawing 6, not carrying out a rotation drive, either, without interlocking with [migration / the inside chip box binding plate 16] the introductory rolls 8 and 8 of a pair with an one-way clutch stops at that location conjointly, without the form P2 of the binding condition in an inside chip box going up with the inside chip box binding plate 16. Moreover, return actuation of a handle 12 is interlocked with, the pair of an eject direction folds the form P2 with which the form derivation member 21 filed during the projection and the inside chip box, and was carried out from the position in readiness to the derivation location where it is the lower part location of a slit, and it leads to roll 25 and 25 side. This pair breaks, and rolls 25 and 25 are interlocked with return actuation of a handle 12, and are rotating the form P2 which filed during the inside chip box and was carried out in the direction which makes it move to an eject direction. Therefore, as shown in drawing 6, a pair breaks and the form P2 which filed during the inside chip box and was carried out is further led to an eject direction through between rolls 25 and 25.

[0049] And after a user finishes return actuation of a handle 12, a pair folds the form P2 which filed during the chip box and was carried out while the pair broke and projecting from rolls 25 and 25, and it is drawn out from between a roll 25 and 25. Then, a pair breaks, rolls 25 and 25 race with an one-way clutch, and the form P2 by which inside chip box binding was carried out is drawn out easily. In addition, since the introductory rolls 8 and 8 of a pair are also raced with an one-way clutch, the drawing of a form P2 by which inside chip box binding was carried out is not barred.

[0050] As mentioned above, if a form P1 is set so that it may become the location of a slit 7 about a location to break

into the form set base 3 by said inside chip box binding equipment 1 inside, and carry out, and the inside chip box binding plate 16 is moved in the inside chip box binding location direction from a position in readiness If it is inserted into a slit 7 and the inside chip box binding plate 16 moves to an inside chip box binding location, a form P1 breaking inside and being carried out in the location at the tip of the inside chip box binding plate 16 Since a form P1 ***** with a stapler 20 in the location at the tip of the inside chip box binding plate 16, the inside chip box location of a form P1 and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, and the location precision of inside binding is good and, moreover, can offer inside chip box binding equipment 1 with easy structure.

[0051] Moreover, with said 1st operation gestalt, since the handle 12 which a user can operate manually is formed, actuation of this handle 12 is interlocked with, the inside chip box binding plate 16 moves between a position in readiness and an inside chip box binding location and inside chip box binding actuation can be performed with a user's hand control, structure is more easy and it is made to cost **.

[0052] Moreover, since the introductory rolls 8 and 8 of a pair were formed in the slit 7, and it prepared with said 1st operation gestalt so that the inside chip box binding plate 16 might advance with a form P1 between the introductory roll 8 of this pair, and 8 In the process in which two or more forms P1 are inserted by migration of the inside chip box binding plate 16 into a slit 7, since two or more forms P1 are smoothly moved by rotation of the introductory rolls 8 and 8 of a pair, inside chip box actuation can be performed, without giving a damage to a form P1 as much as possible.

[0053] With said 1st operation gestalt, the introductory rolls 8 and 8 of a pair Since it is energized with the spring 11 which is an energization means in the direction which can move in the direction of disjunction freely, and contacts Since between the introductory roll 8 of a pair and 8 carries out adjustable according to the thickness of two or more whole forms P1 and the predetermined pinching force is made to act with the spring 11 which is an energization means, an inside chip box can be performed to the form P1 of the whole versatility thickness. Moreover, since the introductory rolls 8 and 8 of a pair rotate in the direction to which both the pinched forms P1 are moved on the occasion of the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 16, a form P1 is pressed by the inside chip box binding plate 16, and in case it breaks inside and is carried out, in order that the introductory rolls 8 and 8 of a pair may send in both the forms P1, the inside chip box of a form P1 is performed smoothly. Furthermore, since actuation of a handle 12 is interlocked with, it rotates, in case the inside chip box binding plate 16 goes to an inside chip box binding location from a position in readiness and the introductory rolls 8 and 8 of a pair do not need to drive the introductory rolls 8 and 8 of a pair separately, its user-friendliness of a user is good.

[0054] Moreover, since the form derivation member 21 which leads the form P2 by which inside chip box binding was carried out to an eject direction was formed and it is discharged with said 1st operation gestalt to the location which the form P2 by which inside chip box binding was carried out tends to take in case the inside chip box binding plate 16 returns from an inside chip box binding location to a position in readiness, a user is user-friendly.

[0055] Moreover, since the form P2 which the pair broke into the location to which a form P2 is led, rolls 25 and 25 were formed, and this pair broke, and advanced between a roll 25 and 25 by the form derivation member 21 with said 1st operation gestalt is moved to an eject direction by rotation and a good inside chip box is made while the form P2 by which inside chip box binding was carried out is discharged to choice or a cone location, a user is very user-friendly. Furthermore, since it interlocks, it moves to actuation of a handle 12, in case the inside chip box binding plate 16 returns from an inside chip box binding location to a position in readiness and the form derivation member 21 does not need to drive the form derivation member 21 separately, its user-friendliness of a user is good.

[0056] Furthermore, a pair breaks by said 1st operation gestalt, and since actuation of a handle 12 is interlocked with and it rotates, and a pair folds rolls 25 and 25 and they do not need to perform the rotation drive of rolls 25 and 25 separately, a user's user-friendliness is good [rolls].

[0057] In addition, since inside chip box binding equipment 1 consists of said 1st operation gestalten, without using no source of power, as compared with the conventional example, it is very producible by low cost.

[0058] Drawing 7 - drawing 22 show the 2nd operation gestalt of this invention. Drawing 7 The perspective view of inside chip box binding equipment, The outline block diagram of chip box binding equipment while, as for drawing 8 , an inside chip box binding plate is located in a position in readiness, The front view of the important section of the inside chip box binding drive system of an inside chip box binding drive and drawing 10 drawing 9 The top view of the inside chip box binding drive system of an inside chip box binding drive, The front view of the important section of the form excretory system of an inside chip box binding device and drawing 12 drawing 11 The top view of the form

excretory system of an inside chip box binding device, The top view of a counter device and drawing 22 of the circuit diagram of a chip box binding drive while drawing 13 - drawing 15 show each process of inside chip box binding actuation and the outline block diagram of chip box binding equipment, drawing 16 - drawing 20 show the switch position of each process of inside chip box binding actuation, and drawing 21 are the front views of a counter device.

[0059] As shown in drawing 7 and drawing 8, the case 32 of inside chip box binding equipment 31 The side plates 32a and 32a of the pair which kept fixed spacing and was set up in parallel, and backplate 32b which really connects between side plate 32a of this pair, and 32a behind, It has 32d of superior lamellas which really connect between dark room 32c which really connects between side plate 32a of a pair, and 32a ahead, side plate 32a of a pair, and 32a in the upper part. Between side plate 32a of a pair, and 32a, the form set base 33 arranged horizontally is being fixed, it is the upper part of this form set base 33, and a gap tooth space with dark room 32c is made into the feed tooth space 34, and let the lower part tooth space of this form set base 33 be the delivery tooth space 35. The form P1 with which it was superimposed on plurality from the front on the form set base 33 (laminating) is set, and the form P2 which filed during the inside chip box and was carried out from the front of the lower part of the form set base 33 is taken out.

[0060] Behind the form set base 33, like said 1st operation gestalt, the stopper member 36 is formed and a form P1 can be easily set now to the position on the form set base 33 by this stopper member 36. The stopper member 36 can be positioned free [migration to the cross direction of the form set base 33] in a proper location. Thereby, it can carry out now adjustable [of the inside chip box binding location] to a desired location about the form P1 of various sizes.

[0061] It is the front location of the form set base 33, and the form right-and-left guides 37 and 37 of a pair are formed near the edge location on either side, and it can set to a right-and-left same location, without carrying out right-and-left gap of two or more forms P1 with the form right-and-left guides 37 and 37 of this pair.

[0062] The slit 38 was formed in the center of abbreviation of the form set base 33, and this slit 38 is prolonged in the longitudinal direction, and it is fully prepared in the long dimension rather than the width of face of the form P1 which files during an inside chip box and is carried out.

[0063] The introductory rolls 39 and 39 of a pair are formed free [rotation] in the slit 38. Each of this introductory roll 39 is the product made of surface rubber of about 60 degrees of hardness, and is constituted as what requires only frictional force and does not require elasticity. The gears 40 and 40 which mesh mutually are being fixed to the end side of the pivots 39a and 39a of each introductory rolls 39 and 39, respectively. As shown in drawing 12, the introductory rolls 39 and 39 of a pair are energized with the spring 41 which is an energization means in the direction which can move in the direction of disjunction freely mutually, holding engagement of gears 40 and 40, and contacts. And the rotation drive of the introductory rolls 39 and 39 of this pair is carried out by the form excretory system of the inside chip box binding drive 42 in the direction which makes a form P1 advance into a slit 38.

[0064] Moreover, the one-way clutch which is not illustrated intervenes between each introductory roll 39 and each pivot 39a, and although rotation of the direction which makes a form P1, as for the introductory rolls 39 and 39 of a pair, advance into a slit 38 is transmitted from each pivot 39a, rotation of the opposite direction is made into transfer impossible. On the occasion of the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 43, the free rotation of the introductory rolls 39 and 39 of a pair is carried out in the direction to which the form P1 which broke inside and was carried out is moved with the inside chip box binding plate 43 by this.

[0065] The inside chip box binding plate 43 is the upper part location of the form set base 33, and is arranged in the upper part location corresponding to the location of the slit 38 of the form set base 33. The guide pin 44 which projects from right-and-left both ends was formed in the upper limit section of the inside chip box binding plate 43, the guide pin 44 of these right and left was inserted in the guide hole 45 prepared in the side plates 32a and 32a of a pair, respectively, and this guide hole 45 is prolonged in the vertical direction. And the inside chip box binding plate 43 drives between the position in readiness of drawing 8 which does not advance into the slit 38 of the form set base 33, and the inside chip box binding locations of drawing 15 which advances into the slit 38 of the form set base 33 by the inside chip box binding drive system of the inside chip box binding drive 42.

[0066] Moreover, it is the lower limit of the inside chip box binding plate 43, i.e., the penetration tip of a slit 38, and the needle bending section (illustration abbreviation) is prepared in the location corresponding to the staplers 46 and 46 of a pair like said 1st operation gestalt, respectively. It is fixed to the lower part location of the slit 38 of the form set base 33, and each of this stapler 46 is arranged so that the U-shaped needle (the so-called staple) 30 may be struck toward the upper part. Moreover, while being located in an inside chip box binding location, the pressure welding of each stapler

46 is carried out through a form P1 to the chip box binding plate 43, and it is set up so that a needle 30 may be struck with this contact pressure to a form P1. Furthermore, it is fixed on the stapler base 47 arranged free [attachment and detachment in a case 32], and the staplers 46 and 46 of a pair are pinched, and it can detach this stapler base 47 now and attach by actuation of 47a. The stapler base 47 consists of sheet metals which have spring nature, and while acting on a stapler 46, it eases the thrust of the chip box binding plate 43.

[0067] As shown in drawing 8, the form derivation member 48 is formed in the lower part location of the form set base 33 between side plate 32a of a pair, and 32a horizontally free [a slide]. The support pin 49 projected from the right-and-left edge of this form derivation member 48 was inserted in the guide hole 50 prepared in the side plates 32a and 32a of a pair, respectively, and this guide hole 50 is prolonged horizontally. And the form derivation member 48 drives between the position in readiness of drawing 15 which leaves from the lower part location of a slit 38, and permits penetration of a form P1, and does not lead a form P1 to an eject direction, and the derivation locations of drawing 8 which projects from the lower part location of a slit 38, and leads a form P2 to an eject direction by the inside chip box binding drive system of the inside chip box binding drive 42.

[0068] Moreover, a pair breaks into the location to which the form P2 is the lower part location of the form set base 33 between side plate 32a of a pair and 32a, and inside chip box binding was carried out [the form] by the form derivation member 48 is led, and rolls 51 and 51 are formed in it. Each of this chip box attachment roll 51 is the product made of rubber of 60 or less degrees of hardness, and is constituted as what has elasticity. This pair breaks and the gears 52 and 52 which mesh mutually are being fixed to the end side of the pivots 51a and 51a of rolls 51 and 51, respectively. Furthermore, it is energized with the spring 53 which is an energization means in the direction which a pair breaks, they are freely movable [rolls 51 and 51 holding engagement of gears 52 and 52] in the direction of disjunction mutually, and contacts. The spring force of this spring 53 is set up more strongly than the introductory roll 39 of a pair, and the spring 41 by the side of 39, in order that introductory roll [of a pair] 39 and 39 side may break and a twist may also perform chip box attachment strongly. And this pair breaks and the rotation drive of the rolls 51 and 51 is carried out by the form excretory system of the inside chip box binding drive 42 in the direction which makes the pinched form P1 discharge.

[0069] Moreover, although the one-way clutch which is not illustrated intervenes between each chip box attachment roll 51 and each pivot 51a, a pair breaks and rotation of the direction where rolls 51 and 51 make a form P2 discharge is transmitted from each pivot 51a, rotation of the opposite direction is made into transfer impossible. If a user pulls the form P2 with which the pair broke and rolls 51 and 51 were pinched by this to an eject direction, it can rotate freely and the form P2 which carried out jamming can be taken out easily.

[0070] Next, the inside chip box binding drive 42 is explained. As the inside chip box binding drive system of the inside chip box binding drive 42 is shown in drawing 9 and drawing 10, it has AC motor 60 which is the only driving source of inside chip box binding equipment 31, the 1st one-way clutch 61 is placed between the periphery of revolving-shaft 50a of this AC motor 60, and the 1st gear 62 is formed. The 1st one-way clutch 61 transmits only rotation of the counterclockwise rotation (it is the same the direction of arrow-head A, and the following at the case where it sees from drawing 9 and drawing 11) of AC motor 60 to the 1st gear 62, and the 1st gear 62 races it by rotation of the clockwise rotation of AC motor 60. The 2nd gear 63 of a major diameter meshes on the 1st gear 62, and the cam pin 65 is being fixed to this 2nd gear 63 by the eccentric location of that rotation support pin 63a. This cam pin 65 is inserted in cam hole 66a of the rocking lever 66, and the rocking lever 66 is supported by side plate 32a considering the kingpin 67 as the supporting point. The guide pin 44 of the inside chip box binding plate 43 is engaging with the upper part side edge of the rocking lever 66, and when the rocking plate 65 rocks by rotation of the 2nd gear 63, the inside chip box binding plate 43 moves up and down. The support pin 49 of the form derivation member 48 is engaging with the lower part side edge of the rocking lever 65, and when the rocking lever 66 rocks by rotation of the 2nd gear 63, horizontal migration of the form derivation member 48 is carried out.

[0071] Moreover, the 3rd gear 64 meshes on the 2nd gear 63, pivot 64a of this 3rd gear 64 is installed even in side plate 32a of another side, and the same device (the 3rd gear 64, the 2nd gear 63, and rocking lever 66) also as the side plate 32a side of another side is established. Thereby, migration of the inside chip box binding plate 43 and the form derivation member 48 is performed certainty and smoothly.

[0072] As mentioned above, while it is at the time of rotation of the counterclockwise rotation (the direction of arrow-head A of drawing 9) of AC motor 60 and the inside chip box binding plate 43 performs both-way migration in an inside chip box binding location from a position in readiness, the form derivation member 48 performs both-way

migration in a derivation location from a position in readiness. And the form derivation member 48 is located in a derivation location by the inside chip box binding plate 43 in a position in readiness, and the form derivation member 48 is located in a position in readiness by the inside chip box binding plate 43 in an inside chip box binding location. [0073] As shown in drawing 11 and drawing 12, the form excretory system of the inside chip box binding drive 42 makes AC motor 60 which is the only driving source of inside chip box binding equipment 31 serve a double purpose as a driving source, the 2nd one-way clutch 70 is placed between the periphery of revolving-shaft 60a of this AC motor 60, and the major-diameter pulley 71 is formed. This 2nd one-way clutch 70 transmits only rotation of the clockwise rotation (it is the same the direction of arrow-head B, and the following at the case where it sees from drawing 9 and drawing 11) of AC motor 60 to the major-diameter pulley 71, and races the major-diameter pulley 71 in rotation of the counterclockwise rotation of AC motor 60. The end side of a timing belt 72 is hung on this major-diameter pulley 71, and the other end side of a timing belt 72 is hung on the minor diameter pulley 73. This minor diameter pulley 73 is being fixed to pivot 39a of one introductory roll 39. Moreover, the idler gear 74 meshed on the gear 40 fixed to pivot 39a of the introductory roll 39 of another side, one side folded this idler gear 74, and it meshes with the gear 52 of pivot 51a of a roll 51.

[0074] As mentioned above, the introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of both the rolls 51 and 51 is carried out in the direction which discharges the form P2 pinched by being at the time of rotation of the clockwise rotation (the direction of arrow-head B of drawing 11) of AC motor 60. And a pair breaks to the peripheral velocity of the introductory rolls 39 and 39 of a pair, and the peripheral velocity of rolls 51 and 51 is set up so that it may become quick in less than 20% of range.

[0075] Next, the circuitry of the inside chip box binding drive 42 is explained based on drawing 16 - drawing 20. As shown in drawing 16 - drawing 20, AC motor 60 has a common terminal t1, the method opposite side terminal t2 of a clock, and the counterclockwise rotation side edge child t3. Capacitor C intervenes between the method opposite side terminal t2 of a clock, and the counterclockwise rotation side edge child t3, a hand of cut changes by carrying out adjustable [of the power-source input to the method opposite side terminal t2 of a clock and the counterclockwise rotation side edge child t3], and it is ****. Between AC motor 60 and AC power supply 75, the start switch SW1 and the motor inversion switch SW2 intervene, and the power-source input to the method opposite side terminal t2 of a clock and the counterclockwise rotation side edge child t3 is changed to it by these two switches SW1 and SW2.

[0076] The start switch SW1 is formed in dark room 32c shown in drawing 7, and is operated by the user. This start switch SW1 is energized by the clockwise rotation selection side edge child t4 with a built-in spring, and is changed to the counterclockwise rotation selection side edge child t5 by depression actuation of a user.

[0077] The motor inversion switch SW2 is formed in the case 32 shown in drawing 8 etc., and is operated by the location of the inside chip box binding plate 43. This motor inversion switch SW2 is energized by the counterclockwise rotation selection side edge child t6 with a built-in spring, and is located in the clockwise rotation selection side edge child t7 by being pushed on the rocking lever 66 in the position in readiness of the inside chip box binding plate 43, and the location of the rocking lever 66 corresponding to that neighborhood. In the location of the rocking lever [/ in addition to the above-mentioned location of the inside chip box binding plate 43] 66, it is located in the counterclockwise rotation selection side edge child t6 according to the spring force of a built-in spring.

[0078] Next, inside chip box binding actuation of inside chip box binding equipment 31 is explained. the time of the stopper member 36 laying the form P1 of predetermined size in the form set base 33 so that the stopper member 36 may be contacted when the case of the form P1 of predetermined size where break inside and carry out exactly in the mid-position, and filed inside and it carried out was explained to the example -- a form P1 -- it justifies so that the mid-position may turn into a location of a slit 38 exactly.

[0079] If a power source is supplied to inside chip box binding equipment 31, as shown in drawing 16, the alternating current of AC power supply 75 will be inputted into the method opposite side terminal t2 of a clock of AC motor 60, and AC motor 60 will rotate clockwise. The introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of the rolls 51 and 51 is carried out by the clockwise rotation of AC motor 60 in a form eject direction. As it is in such a condition and is shown in drawing 8, a user inserts the form P1 with which it was superimposed on plurality on the form set base 33, and it sets to the location where the insertion apical surface of a form P1 contacts the stopper member 36.

[0080] Next, a user does the depression of the start switch SW1. Then, as shown in drawing 17, a power-source input is changed to the counterclockwise rotation side edge child t3 of AC motor 60, and AC motor 60 carries out inverse

rotation counterclockwise. While the introductory rolls 39 and 39 of a pair and a pair break and the rotation drive of rolls 51 and 51 is stopped by the counterclockwise rotation of AC motor 60, the form derivation member 48 starts [the inside chip box binding plate 43] migration from a position in readiness from a derivation location to a position in readiness in an inside chip box binding location again, respectively. If it descends from the upper part of a form P1, and the inside chip box binding plate 43 of a position in readiness contacts a form P1 and descends further from this condition, it will be inserted in the slit 38 of the form set base 33 with the inside chip box binding plate 43, a form P1 being bent with the inside chip box binding plate 43 in that contact location. The introductory rolls 39 and 39 of a pair carry out flattery rotation in the direction to which a form P1 is moved with the inside chip box binding plate 43, and a form P1 is smoothly inserted by descent of the inside chip box binding plate 43 into a slit 38. Moreover, migration of the form P1 inserted in connection with the inside chip box binding plate 43 and this is permitted by leaving from the derivation location whose form derivation member 48 is the lower part location of a slit 38.

[0081] Moreover, since it stops pressing the motor inversion switch SW2 in the rocking lever 66 as shown in drawing 18 and drawing 19 after being in the above-mentioned process of operation and pushing the start switch SW1 when the rocking lever 66 moves for a while, the motor inversion switch SW2 is changed to a counterclockwise rotation selection side, and even if a user cancels the depression of the start switch SW1, AC motor 60 continues rotating counterclockwise.

[0082] And if the inside chip box binding plate 43 descends to an inside chip box binding location as shown in drawing 13, the pressure welding of the needle bending section of the inside chip box binding plate 43 will be carried out to the staplers 46 and 46 of a pair through a form P1. The tip of a needle 30 where each stapler 46 performed ***** and was struck with this contact pressure by the form P1 is bent in the needle bending section. It becomes the form P2 which the form P1 with which it was superimposed on plurality broke inside, and was carried out now, and filed inside and was carried out.

[0083] Next, although the inside chip box binding plate 43 will go up shortly if the inside chip box binding plate 43 descends to an inside chip box binding location, it also stops conjointly at the location that the introductory rolls 39 and 39 of a pair do not rotate without migration of the inside chip box binding plate 43 being interlocked with with an one-way clutch, without the form P2 of the binding condition in an inside chip box going up with the inside chip box binding plate 43. And as shown in drawing 14, the inside chip box binding plate 43 goes up to a position in readiness. Moreover, the pair of an eject direction folds the form P2 with which the form derivation member 48 filed during the projection and the inside chip box, and was carried out from the position in readiness to the derivation location, and it leads to roll 51 and 51 side.

[0084] Moreover, if it is in the above-mentioned process of operation and the inside chip box binding plate 43 goes up to near the position in readiness, as shown in drawing 20, the rocking lever 66 will push the motor inversion switch SW2 again, a power-source input will be changed to the method opposite side terminal t2 of a clock of AC motor 60, and AC motor 60 will carry out inverse rotation clockwise. While the inside chip box binding plate 43 is suspended in a position in readiness and the form derivation member 48 is stopped by this in both derivation locations, the introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of the rolls 51 and 51 is carried out in a form eject direction. Therefore, a pair breaks and the form P2 which filed during the inside chip box and was carried out is discharged through between rolls 51 and 51.

[0085] As mentioned above, a form P1 is set so that it may become the location of a slit 38 about a location to break into the form set base 33 by said inside chip box binding equipment 31 inside, and carry out. The inside chip box binding plate 43 is automatically moved in the inside chip box binding location direction from a position in readiness only by operating the start switch SW1. If it is inserted into a slit 38 and the inside chip box binding plate 43 moves to an inside chip box binding location, a form P1 breaking inside and being carried out in the location at the tip of the inside chip box binding plate 43. Since a form P1 ***** with a stapler 46 in the location at the tip of the inside chip box binding plate 43, the inside chip box location of a form P1 and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, and the location precision of inside binding is good and, moreover, can offer inside chip box binding equipment 31 with easy structure.

[0086] With said 2nd operation gestalt, since AC motor 60 is formed and it was made for the inside chip box binding plate 43 to move between a position in readiness and an inside chip box binding location with the driving force of this AC motor 60, an inside chip box binding activity can be performed with the driving force of AC motor 43. Therefore, while being based on hand control, a user's activity is mitigated compared with a chip box binding activity,

consequently it becomes reduction of an activity mistake, and improvement in the speed of processing. Moreover, since actuation of the inside chip box binding plate 43 is stabilized compared with a chip box binding activity while being based on hand control, the quality of inside chip box binding improves. Moreover, there are not improvement in the speed of processing and instability.

[0087] Since it constituted from said 2nd operation gestalt so that the introductory rolls 39 and 39 of a pair and a pair might break and rolls 51 and 51 might rotate with the driving force of AC motor 60, and the introductory rolls 39 and 39 of a pair and a pair break and the drive of rolls 51 and 51 is made by AC motor 60 which drives the inside chip box binding plate 43, the number of motors to carry can be reduced. With the 2nd operation gestalt, inside chip box binding equipment 31 is produced by carrying one AC motor 60.

[0088] Next, the counter device 80 attached to the inside chip box binding equipment 31 of the 2nd operation gestalt is explained based on drawing 21 and drawing 22.

[0089] As shown in drawing 21 and drawing 22, the counter device 80 The worm gear 81 which displays the remaining number of stitch of staplers 46 and 46, and was fixed to support shaft 64a, On the worm gear 83 which geared with this worm gear 81 and was supported by the buttress plate 82 free [rotation], this worm gear 83, and the same axle And it consists of leaves 85 to which the dial plate 84 which can rotate separately independently, the dial plate 84, and a worm gear 83 are stuck by predetermined frictional force. The graduation is formed in the periphery of the dial plate 84 at intervals of predetermined, and both the dial plates 84 rotate according to the spring force of a leaf 85 at the time of rotation of a worm gear 83. Since angle of rotation is determined in proportion to the rotational frequency of the 2nd gear 63, a worm gear 83 remains on the dial plate 84 using this relation, and displays a number of stitch.

[0090] That is, since the 2nd gear 63 rotates one time in one ***** actuation, the 3rd gear 64 rotates only the rotational frequency decided by gear ratio with the 2nd gear 63. Moreover, the 3rd gear 64 and a worm gear 81 are the same rotational frequencies, and, as for a worm gear 83, only one gear tooth progresses by one rotation of a worm gear 81. Therefore, proportionally, the rotational frequency of the 2nd gear 62 and angle of rotation of a worm gear 83 can remain by this proportionality, and can display a number of stitch. For example, what is necessary is just to let the numbers of teeth of a worm gear 83 be 200 gear teeth, in order to make it a worm gear 83 rotate one time exactly in the place which 60 gear teeth and the 3rd gear are [100 and the 2nd gear 63] 30 gear teeth, and the number of stitch of 100 stitches struck.

[0091] If this counter device 80 is carried, a user can know the supplement stage of a needle 30, before a stapler 46 and the needle 30 in 46 are lost.

[0092] In addition, in using the needle 30 used to the middle of the number of stitch connected [one] by the needle 30 which broke in the middle of and one, a user sets the dial plate 84 to the rotation location corresponding to the number of stitch. [the connected number of stitch] If it does in this way, it remains, also when using the needle 30 used to the middle of the number of stitch connected [one] by the needle 30 which broke in the middle of and one, and a number of stitch can be displayed correctly. [the connected number of stitch]

[0093] Drawing 23 is the outline block diagram of the modification of a counter device. As shown in drawing 23, the counter devices 90 of a modification are the 2nd gear 63 and the same axle, and consist of the 1st counter gear 91 fixed by predetermined frictional force, the 2nd counter gear 92 to which it geared with these 1st counter gear 91, and the mark (an arrow head illustrates a mark location) was attached, and a mark plate 93 with which contiguity arrangement was carried out and the mark (an arrow head illustrates a mark location) was attached to these 2nd counter gear 92. The 1st counter gear 91 are made into the number of teeth carried out +one [number of stitch / N / which is set to a stapler 46 / set], and the 2nd counter gear 92 are set as the number of teeth of the set number of stitch N set to a stapler 46, and the same number. When 1 time, i.e., *****, is carried out once, the 2nd counter gear 92 will carry out 1/N rotation of the inside chip box binding actuation with one rotation. When N time of N time, i.e., the *****, is carried out, the 2nd counter gear 92 will carry out N rotation plus 1 (= N/N) rotation of the inside chip box binding actuation. Therefore, by constituting in this way, the mark location of the 2nd counter gear 92 can make it able to stop in the location rotated one time exactly, and can display the remaining number of stitch.

[0094] In addition, with the 2nd operation gestalt, in order to ensure actuation, after setting a form P1 to the location which contacts the stopper member 36, the user considered as the configuration which carries out the depression of the start switch SW1, but if the location where the form P1 of the stopper member 36 contacts is equipped with the start switch SW1, it can carry out only with setting a form P1 as the configuration to which a start is carried out automatically.

[0095] In addition, although the electric system of automatic inside chip box binding equipment 31 is cheaply producible with said 2nd operation gestalt since AC motor 60 was used as a motor, of course, you may produce except AC-motor 60.

[0096] In addition, according to said 1st and 2nd operation gestalt, although the case of a form P1 where binding in an inside chip box was performed exactly in the mid-position was explained, when [of a form P1] filing during an inside chip box and carrying out exactly except the mid-position, it can apply similarly. Moreover, although the case where staplers 20 and 46 were formed in two places, and a needle 30 was struck to two places of a form P1 was explained, as for the number of staplers 20 and 46, it is needless to say that one piece or three pieces or more are sufficient.

[0097]

[Effect of the Invention] If according to invention of claim 1 a form is set so that it may become a slit location about a location to fold in a form set base inside and use as it and an inside chip box binding plate is moved in the inside chip box binding location direction from a position in readiness as explained above Since a form ***** with a stapler in the location at the tip of an inside chip box binding plate when it is inserted into a slit and an inside chip box binding plate moves to an inside chip box binding location, a form breaking inside and being carried out in the location at the tip of an inside chip box binding plate, The inside chip box location of a form and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, the location precision of inside binding is good, and, moreover, structure is easy.

[0098] Since according to invention of claim 2 a handle is operated manually and inside chip box binding actuation can be performed, structure is more easy and it is made to cost **.

[0099] According to invention of claim 3, since inside chip box binding actuation can be performed with the driving force of a motor, while being based on hand control, a user's activity is mitigated compared with a chip box binding activity, consequently it becomes reduction of a mistake, and improvement in the speed of processing. Moreover, since actuation of an inside chip box binding plate is stabilized compared with a chip box binding activity while being based on hand control, the quality of inside chip box binding improves. Furthermore, there are not improvement in the speed of processing and instability.

[0100] According to invention of claim 4, in the process in which two or more forms are inserted by migration of an inside chip box binding plate into a slit, since two or more forms are smoothly moved by rotation of the introductory roll of a pair, inside chip box actuation can be performed, without giving a damage to a form as much as possible.

[0101] Since according to invention of claim 5 between the introductory rolls of a pair carries out adjustable according to the thickness of two or more whole forms and the predetermined pinching force is made to act with an energization means, an inside chip box can be performed to the form of the whole versatility thickness.

[0102] According to invention of claim 6, a form is pressed by the inside chip box binding plate, and in case it breaks inside and is carried out, in order that the introductory roll of a pair may send in both forms, the inside chip box of a form is performed smoothly.

[0103] According to invention of claim 7, since it is not necessary to drive the introductory roll of a pair separately, it is user-friendly.

[0104] Since the drive of the introductory roll of a pair is made by the motor which drives an inside chip box binding plate according to invention of claim 8, the number of motors to carry can be reduced.

[0105] Since it is discharged to the location which the form by which inside chip box binding was carried out tends to take according to invention of claim 9, a user is user-friendly.

[0106] Since according to invention of claim 10 a good inside chip box is made while the form by which inside chip box binding was carried out is discharged to choice or a cone location, it is very user-friendly.

[0107] According to invention of claim 11, since it is not necessary to drive a form derivation member separately, it is user-friendly.

[0108] Since according to invention of claim 12 a pair breaks and it is not necessary to perform the rotation drive of a roll separately, it is user-friendly.

[0109] Since according to invention of claim 13 a pair breaks and the drive of a roll is made by the motor which drives in inside chip box binding plate, or the motor which drives the introductory roll of a pair in addition to this, the number of motors to carry can be reduced.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] The form with which it was superimposed on plurality (laminating) is folded inside, and this
nvention carries out it, and while filing with a pointer stop in this location which carried out the inside chip box, it
relates to chip box binding equipment.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] There are some which are shown in drawing 24 as this kind of inside chip box binding equipment of the former. As shown in drawing 24, inside chip box binding equipment 100 Two or more feed bases 101 in which the form with which it has been arranged in the vertical direction and superimposed on plurality is laid, respectively, A form feeding means which is not illustrated to feed paper to two or more forms set to this feed base 101, A form conveyance means 102 to convey two or more forms to which paper was fed by this form feeding means in a ***** location and an inside binding location, respectively, and to set them to them, The needle drummer stage 103 which strikes a needle (the so-called staple) to two or more forms set to the ***** location with this form conveyance means 102, The chip box means 104 while folding two or more forms set to the inside binding location inside and carrying out them with said form conveyance means 102, A form discharge means 105 to move two or more forms which broke inside with the inside [this] chip box means 104, and were carried out to an eject direction, It has the delivery base 107 in which the form P which filed during the chip box and was carried out while being discharged by the trimer means 106 which carries out tree MINGU of the form P which is conveyed by this form discharge means 105, and by which inside chip box binding was carried out, and this trimer means 106 is laid.

[0003] In the above-mentioned configuration, two or more forms set to the feed base 101 are conveyed by the form conveyance means 102 through a form feeding means, and two or more forms are set to a ***** location with this form conveyance means 102. The needle drummer stage 103 strikes a needle to two or more forms set to this ***** location, a needle is struck by the ***** location of a request of two or more forms by this, and it is filed.

[0004] Next, two or more forms are set to an inside chip box location by the form conveyance means 102. The inside chip box means 104 performs an inside chip box to two or more forms set to the inside [this] chip box location, and two or more forms by this break inside, and are carried out in a ***** location. The form P which filed during the inside chip box and was carried out is conveyed by the form discharge means 105, is led to the trimer means 106, and after tree MINGU is carried out with the trimer means 106, it is delivered to the delivery base 107.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] If according to invention of claim 1 a form is set so that it may become a slit location about a location to fold in a form set base inside and use as it and an inside chip box binding plate is moved in the inside chip box binding location direction from a position in readiness as explained above Since a form ***** with a stapler in the location at the tip of an inside chip box binding plate when it is inserted into a slit and an inside chip box binding plate moves to an inside chip box binding location, a form breaking inside and being carried out in the location at the tip of an inside chip box binding plate, The inside chip box location of a form and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, the location precision of inside binding is good, and, moreover, structure is easy.

[0098] Since according to invention of claim 2 a handle is operated manually and inside chip box binding actuation can be performed, structure is more easy and it is made to cost **.

[0099] According to invention of claim 3, since inside chip box binding actuation can be performed with the driving force of a motor, while being based on hand control, a user's activity is mitigated compared with a chip box binding activity, consequently it becomes reduction of a mistake, and improvement in the speed of processing. Moreover, since actuation of an inside chip box binding plate is stabilized compared with a chip box binding activity while being based on hand control, the quality of inside chip box binding improves. Furthermore, there are not improvement in the speed of processing and instability.

[0100] According to invention of claim 4, in the process in which two or more forms are inserted by migration of an inside chip box binding plate into a slit, since two or more forms are smoothly moved by rotation of the introductory roll of a pair, inside chip box actuation can be performed, without giving a damage to a form as much as possible.

[0101] Since according to invention of claim 5 between the introductory rolls of a pair carries out adjustable according to the thickness of two or more whole forms and the predetermined pinching force is made to act with an energization means, an inside chip box can be performed to the form of the whole versatility thickness.

[0102] According to invention of claim 6, a form is pressed by the inside chip box binding plate, and in case it breaks inside and is carried out, in order that the introductory roll of a pair may send in both forms, the inside chip box of a form is performed smoothly.

[0103] According to invention of claim 7, since it is not necessary to drive the introductory roll of a pair separately, it is user-friendly.

[0104] Since the drive of the introductory roll of a pair is made by the motor which drives an inside chip box binding plate according to invention of claim 8, the number of motors to carry can be reduced.

[0105] Since it is discharged to the location which the form by which inside chip box binding was carried out tends to take according to invention of claim 9, a user is user-friendly.

[0106] Since according to invention of claim 10 a good inside chip box is made while the form by which inside chip box binding was carried out is discharged to choice or a cone location, it is very user-friendly.

[0107] According to invention of claim 11, since it is not necessary to drive a form derivation member separately, it is user-friendly.

[0108] Since according to invention of claim 12 a pair breaks and it is not necessary to perform the rotation drive of a roll separately, it is user-friendly.

[0109] Since according to invention of claim 13 a pair breaks and the drive of a roll is made by the motor which drives an inside chip box binding plate, or the motor which drives the introductory roll of a pair in addition to this, the number

of motors to carry can be reduced.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the form P which is a good inside chip box when it is necessary to perform alignment so that the ***** location where the needle drummer stage 103 makes ***** a form, and a chip box location while the inside chip box means 104 makes an inside chip box a form may turn into the same location, and both locations shift with said inside chip box binding equipment 100 of the former, and was filed inside cannot be obtained. In order to obtain the form P which was a good inside chip box, and filed inside and was carried out, an alignment device is required, and there was a problem of structure being complicated.

[0006] Then, this invention is made that the above mentioned technical problem should be solved, and is folded inside, and the location precision of inside binding is good and, moreover, it aims at offering inside chip box binding equipment with easy structure.

[Translation done.]

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MEANS

[Means for Solving the Problem] The form set base where a form is set to the top-face side where, as for invention of claim 1, a slit is prepared, and opening of this slit is carried out, A chip box binding plate while are prepared free [migration] between chip box binding locations while advancing into the position in readiness and this slit which do not advance into said slit of this form set base, and having the needle bending section at the tip of penetration of said slit, An inside [this] chip box binding plate carries out a pressure welding through said form in the condition of being located in an inside chip box binding location, and it is characterized by having the stapler which ***** in said form. [0008] If a form is set so that it may become a slit location about a location to break into a form set base by inside [this] chip box binding equipment inside, and carry out, and an inside chip box binding plate is moved in the inside chip box binding location direction from a position in readiness If it is inserted into a slit and an inside chip box binding plate moves to an inside chip box binding location, a form breaking inside and being carried out in the location at the tip of an inside chip box binding plate Since a form ***** with a stapler in the location at the tip of an inside chip box binding plate, the inside chip box location of a form and an inside binding location are inevitably in agreement, and do not need to add a positioning device. [0009] Invention of claim 2 is inside chip box binding equipment according to claim 1, and is characterized by preparing an operational handle manually, and actuation of this handle being interlocked with, and making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location. [0010] In addition to an operation of invention of claim 1, with inside [this] chip box binding equipment, inside chip box binding actuation can be performed with a user's hand control. [0011] Invention of claim 3 is inside chip box binding equipment according to claim 1, forms a motor and is characterized by making it said inside chip box binding plate move between a position in readiness and an inside chip box binding location with the driving force of this motor. [0012] In addition to an operation of invention of claim 1, with inside [this] chip box binding equipment, inside chip box binding actuation can be performed with the driving force of a motor. [0013] Invention of claim 4 is inside chip box binding equipment according to claim 1 to 3, forms the introductory roll of a pair in said slit, and is characterized by making it said inside chip box binding plate advance with said form between the introductory rolls of this pair. [0014] In addition to an operation of invention of claim 1 - claim 3, in inside [this] chip box binding equipment, two or more forms are smoothly moved by rotation of the introductory roll of a pair in the process in which two or more forms are inserted by migration of an inside chip box binding plate into a slit. [0015] Invention of claim 5 is inside chip box binding equipment according to claim 4, and the introductory roll of said pair is characterized by being energized by the energization means in the direction which can move in the direction of disjunction freely, and contacts. [0016] According to the thickness of two or more whole forms, between the introductory rolls of a pair carries out adjustable, and the predetermined pinching force is made to act with an energization means with inside [this] chip box binding equipment in addition to an operation of invention of claim 4. [0017] Invention of claim 6 is inside chip box binding equipment according to claim 4 or 5, and the introductory roll of said pair is characterized by rotating in the direction to which both the forms that broke inside and were carried out are moved on the occasion of the migration in an inside chip box binding location from the position in readiness of an inside chip box binding plate.

[0018] With inside [this] chip box binding equipment, in addition to an operation of invention of claim 4 or claim 5, a form is pressed by the inside chip box binding plate, and in case it breaks inside and is carried out, the introductory roll of a pair sends in both forms.

[0019] Invention of claim 7 is inside chip box binding equipment according to claim 6, and the introductory roll of said pair is characterized by for actuation of said handle being interlocked with and rotating, in case said inside chip box binding plate goes to an inside chip box binding location from a position in readiness.

[0020] In addition to an operation of invention of claim 6, it is not necessary to drive the introductory roll of a pair separately with inside [this] chip box binding equipment.

[0021] Invention of claim 8 is inside chip box binding equipment according to claim 6, and the introductory roll of said pair is characterized by rotating with the driving force of said motor.

[0022] In addition to invention of claim 6, with inside [this] chip box binding equipment, the drive of the introductory roll of a pair is made by the motor which drives an inside chip box binding plate.

[0023] Invention of claim 9 is inside chip box binding equipment according to claim 1 to 8, and in case said inside chip box binding plate returns from an inside chip box binding location to a position in readiness, it is characterized by preparing the form derivation member which leads said form by which inside chip box binding was carried out to an eject direction.

[0024] In addition to an operation of invention of claim 1 - claim 8, with inside [this] chip box binding equipment, it is discharged to the location which the form by which inside chip box binding was carried out tends to take.

[0025] Invention of claim 10 is inside chip box binding equipment according to claim 9, and is characterized by moving said form which the pair broke into the location to which said form is led by said form derivation member, the roll was formed, and this pair broke, and advanced between rolls to an eject direction by rotation.

[0026] With inside [this] chip box binding equipment, while the form by which inside chip box binding was carried out is discharged to choice or a cone location in addition to an operation of invention of claim 9, a good inside chip box is made.

[0027] Invention of claim 11 is inside chip box binding equipment according to claim 9 or 10, and said form derivation member is characterized by interlocking and moving to actuation of said handle, in case said inside chip box binding plate returns from an inside chip box binding location to a position in readiness.

[0028] In addition to an operation of invention of claim 9 or claim 10, it is not necessary to drive a form derivation member separately with inside [this] chip box binding equipment.

[0029] Invention of claim 12 is inside chip box binding equipment according to claim 10 or 11, said pair breaks and a roll is characterized by for actuation of said handle being interlocked with and rotating.

[0030] In addition to an operation of invention of claim 10 or claim 11, a pair breaks by inside [this] chip box binding equipment, and it is not necessary to perform the rotation drive of a roll separately.

[0031] Invention of claim 13 is inside chip box binding equipment according to claim 10 or 11, and it is characterized by for said pair breaking and a roll rotating with the driving force of said motor.

[0032] In addition to invention of claim 10 or claim 11, by the motor which drives an inside chip box binding plate, or the motor which drives the introductory roll of a pair in addition to this, a pair breaks and the drive of a roll is made with inside [this] chip box binding equipment.

[0033]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained based on a drawing.

[0034] Drawing 1 - drawing 6 show the 1st operation gestalt of this invention. Drawing 1 The perspective view of inside chip box binding equipment, The outline block diagram of inside chip box binding equipment and drawing 3 drawing 2 The perspective view of the important section of inside chip box binding equipment, The outline block diagram with which drawing 4 shows the condition that two or more forms were set to a form set base, the outline block diagram in which an inside chip box binding plate shows the condition that drawing 5 is located in an inside chip box binding location, and drawing 6 are the outline block diagrams showing the condition that the inside chip box binding plate was returned to the position in readiness from the inside chip box binding location.

[0035] As shown in drawing 1 - drawing 3 , the case 2 of inside chip box binding equipment 1 has the side plates 2a and 2a of the pair which kept fixed spacing and was set up in parallel, and backplate 2b which really connects between side plate 2a of this pair, and 2a behind. Between side plate 2a of a pair, and 2a, the form set base 3 arranged horizontally is being fixed, and the upper part tooth space of this form set base 3 is made into the feed tooth space 4, and let the lower

part tooth space of this form set base 3 be the delivery tooth space 5. The form P1 with which it was superimposed on plurality from the front on the form set base 3 (laminating) is set, and the form P2 which filed during the inside chip box and was carried out from the front of the lower part of the form set base 3 is taken out.

[0036] Moreover, the stopper member 6 is formed behind the form set base 3, and a form P1 can be easily set now to the position on the form set base 3 by this stopper member 6. Namely, the location which wants to carry out inside chip box binding of two or more forms P1 can be set now according to a slit location by making two or more forms P1 advance until it runs against the stopper member 6. Moreover, the stopper member 6 can be positioned now in a proper location, and, thereby, can make free adjustable [of the migration of an inside chip box binding location to the cross direction of the form set base 3] now to a desired location about the form P1 of various sizes. Furthermore, the slit 7 was formed in the center of abbreviation of the form set base 3, and this slit 7 is prolonged in the longitudinal direction, and it is prepared in the long dimension rather than the width of face of the form P1 which files during an inside chip box and is carried out at least.

[0037] As shown in drawing 2, in the slit 7, the introductory rolls 8 and 8 of a pair are formed free [rotation], and the gear 9 which meshes mutually is being fixed to the end side of pivot 8a of each of this introductory roll 8, respectively. As shown in drawing 3, while a pinion 10 is fixed to the other end side of pivot 8a of one introductory roll 8 and this pinion 10 mentions later, it has geared on the rack 18 of the chip box binding plate 16. That is, the introductory rolls 8 and 8 of a pair are interlocked with the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 16, and rotate the form P1 which broke inside and was carried out in the direction to which it moves with the inside chip box binding plate 16. Moreover, the introductory rolls 8 and 8 of a pair are energized with the spring 11 which is an energization means in the direction which can move in the direction of disjunction freely mutually, holding engagement of a gear 9, and contacts. Furthermore, the one-way clutch which is not illustrated intervenes between each introductory roll 8 and each pivot 8a, the rotation of a direction each introductory roll 8 makes [rotation] a form P1 advance [rotation] into a slit 7 is transmitted from each pivot 8a, and rotation of the opposite direction is made into transfer impossible.

[0038] As shown in drawing 1 - drawing 3, between side plate 2a of a pair, and 2a, a handle 12 is supported free [rotation] through a pivot 13 in the end face side, and it is prepared by arranging the tip side above the form set base 3 so that a user can operate it manually. Actuation of this handle 12 is delivery actuation of the direction of arrow-head A of drawing 2, and return actuation of the direction of arrow-head B of drawing 2. Moreover, it is supported by the lower part of the mid-position of a handle 12 free [rotation of the press roll 14], and this press roll 14 is contacted on press operation section 16a of the inside chip box binding plate 16.

[0039] The inside chip box binding plate 16 is the upper part location of the form set base 3, and is arranged in the upper part location corresponding to the location of the slit 7 of the form set base 3. It was inserted in the guide hole 17 shown in drawing 1 prepared in the side plates 2a and 2a of a pair, respectively for the right-and-left both ends [a part of] of the inside chip box binding plate 16, and this guide hole 17 is prolonged in the vertical direction. Moreover, press operation section 16a is being fixed to the upper limit of the inside chip box binding plate 16. This press operation section 16a and the member which supports the press roll 14 of a handle 12 are connected through the connection member 15, and it holds connection by being connected through long hole 15a, carrying out adjustable [of some link length] between press operation section 16a and the connection member 15. And the inside chip box binding plate 16 is moved between the position in readiness shown as a continuous line in drawing 2 which is interlocked with actuation of a handle 12 and does not advance into the slit 7 of the form set base 3, and a chip box binding location while an imaginary line shows in drawing 2 which advances into the slit 7 of the form set base 3.

[0040] Furthermore, the rack 18 was formed in the part projected from side plate 2a by the side of the end of the inside chip box binding plate 16, and as this rack 18 described above, it has geared to the pinion 10 of the introductory rolls 8 and 8 of a pair. And the introductory rolls 8 and 8 of a pair rotate on the occasion of the migration in an inside chip box binding location from the position in readiness of one inside chip box binding plate 16. That is, the introductory rolls 8 and 8 of a pair are also interlocked with delivery actuation of a handle 12, and rotate.

[0041] Moreover, it is the lower limit of the inside chip box binding plate 16, i.e., the penetration tip of a slit 7, and the needle bending section 19 is formed in the location corresponding to the staplers 20 and 20 of a pair, respectively. It is fixed to the lower part location of the slit 7 of the form set base 3, and each of this stapler 20 is arranged so that the U-shaped needle (the so-called staple) 30 may be struck toward the upper part. Moreover, while being located in an inside chip box binding location, the pressure welding of each stapler 20 is carried out through a form P1 to the chip box

binding plate 16, and it is set up so that a needle 30 may be struck with this contact pressure to a form P1.

[0042] As shown in drawing 1 - drawing 3, the form derivation member 21 is formed in the lower part location of the form set base 3 between side plate 2a of a pair, and 2a horizontally free [a slide]. The support pin 22 of this form derivation member 21 engages with the cam hole 24 of the rocking plate 23 fixed to the pivot 13 of a handle 12, is interlocked with rotation actuation of a handle 12, and is moved. that is, the inside chip box binding plate 16 in the bottom location of the handle 12 made into an inside chip box binding location Leave from the lower part location of a slit 7, and penetration of a form P1 is permitted. It is located in the position in readiness which shows a form P1 by the imaginary line in drawing 2 which is not led to an eject direction, and is located in the derivation location shown as a continuous line in drawing 2 which projects from the lower part location of a slit 7, and leads a form P2 to an eject direction in the upper location of the handle 12 which makes the inside chip box binding plate 16 a position in readiness.

[0043] Moreover, a pair breaks into the location to which the form P2 which was the lower part location of the form set base 3 between side plate 2a of a pair and 2a, and filed during the inside chip box and was carried out by the form derivation member 21 is led, and rolls 25 and 25 are formed in it. This pair breaks, a pulley 26 is formed in one pivot 25a of rolls 25 and 25, and the belt 28 is hung between this pulley 26 and the pulley 27 fixed to the pivot 13 of a handle 12. The one-way clutch which is not illustrated intervenes between each chip box attachment roll 25 and each pivot 25a, only rotation of the hand of cut which moves the form P2 which filed during the inside chip box and was carried out to an eject direction breaks from each pivot 25a, and the transfer of it on a roll 25 is attained. That is, if rotation actuation of the handle 12 is carried out from a bottom location in an upper location, a pair breaks through a belt 28 and this rotation is transmitted to rolls 25 and 25, and it will rotate in order to move the form P2 with which this pair broke and rolls 25 and 25 were pinched to an eject direction.

[0044] Next, inside chip box binding actuation of inside chip box binding equipment 1 is explained. the time of the stopper member 6 laying the form P1 of predetermined size in the form set base 3 so that the stopper member 6 may be contacted when the case of the form P1 of predetermined size where break inside and carry out exactly in the mid-position, and filed inside and it carried out was explained to the example -- a form P1 -- it justifies so that the mid-position may turn into a location of a slit 7 exactly.

[0045] If a user inserts the form P1 with which it was superimposed on plurality on the form set base 3, and it sets to the location where the insertion apical surface of a form P1 contacts the stopper member 6, next delivery actuation of the handle 12 is carried out in the direction of arrow-head A of drawing 4 as shown in drawing 4 If the inside chip box binding plate 16 of a position in readiness descends from the upper part of a form P1, contacts a form P1 and carries out delivery actuation of the handle 12 more nearly further than this condition It is inserted in the slit 7 of the form set base 3 with the inside chip box binding plate 16, a form P1 being bent with the inside chip box binding plate 16 in the contact location.

[0046] Moreover, the introductory rolls 8 and 8 of a pair rotate in the direction to which a form P1 is moved with the inside chip box binding plate 16, and a form P1 is smoothly inserted by descent of the inside chip box binding plate 16 into a slit 7. Moreover, migration of the form P1 with which the form derivation member 21 leaves from the derivation location which is a lower part location of a slit 7, and is inserted by delivery actuation of a handle 12 in connection with the inside chip box binding plate 16 and this is permitted.

[0047] And a user will suspend delivery actuation of a handle 12, if the inside chip box binding plate 16 arrives at an inside chip box binding location. If the inside chip box binding plate 16 descends to an inside chip box binding location as shown in drawing 5, the pressure welding of the needle bending section 19 of the inside chip box binding plate 16 will be carried out to the staplers 20 and 20 of a pair through a form P1. The tip of a needle 30 where each stapler 20 performed ***** and was struck with this contact pressure by the form P1 is bent in the needle bending section 19. It becomes the form P2 which the form P1 with which it was superimposed on plurality broke inside, and was carried out now, and filed inside and was carried out.

[0048] Next, although return actuation of this handle 12 will be interlocked with and the inside chip box binding plate 16 will go up if a user does return actuation of the handle 12 in the direction of arrow-head B of drawing 6, not carrying out a rotation drive, either, without interlocking with [migration / the inside chip box binding plate 16] the introductory rolls 8 and 8 of a pair with an one-way clutch stops at that location conjointly, without the form P2 of the binding condition in an inside chip box going up with the inside chip box binding plate 16. Moreover, return actuation of a handle 12 is interlocked with, the pair of an eject direction folds the form P2 with which the form derivation member 21

filed during the projection and the inside chip box, and was carried out from the position in readiness to the derivation location where it is the lower part location of a slit, and it leads to roll 25 and 25 side. This pair breaks, and rolls 25 and 25 are interlocked with return actuation of a handle 12, and are rotating the form P2 which filed during the inside chip box and was carried out in the direction which makes it move to an eject direction. Therefore, as shown in drawing 6, a pair breaks and the form P2 which filed during the inside chip box and was carried out is further led to an eject direction through between rolls 25 and 25.

[0049] And after a user finishes return actuation of a handle 12, a pair folds the form P2 which filed during the chip box and was carried out while the pair broke and projecting from rolls 25 and 25, and it is drawn out from between a roll 25 and 25. Then, a pair breaks, rolls 25 and 25 race with an one-way clutch, and the form P2 by which inside chip box binding was carried out is drawn out easily. In addition, since the introductory rolls 8 and 8 of a pair are also raced with an one-way clutch, the drawing of a form P2 by which inside chip box binding was carried out is not barred.

[0050] As mentioned above, if a form P1 is set so that it may become the location of a slit 7 about a location to break into the form set base 3 by said inside chip box binding equipment 1 inside, and carry out, and the inside chip box binding plate 16 is moved in the inside chip box binding location direction from a position in readiness. If it is inserted into a slit 7 and the inside chip box binding plate 16 moves to an inside chip box binding location, a form P1 breaking inside and being carried out in the location at the tip of the inside chip box binding plate 16. Since a form P1 ***** with a stapler 20 in the location at the tip of the inside chip box binding plate 16, the inside chip box location of a form P1 and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, and the location precision of inside binding is good and, moreover, can offer inside chip box binding equipment 1 with easy structure.

[0051] Moreover, with said 1st operation gestalt, since the handle 12 which a user can operate manually is formed, actuation of this handle 12 is interlocked with, the inside chip box binding plate 16 moves between a position in readiness and an inside chip box binding location and inside chip box binding actuation can be performed with a user's hand control, structure is more easy and it is made to cost **.

[0052] Moreover, since the introductory rolls 8 and 8 of a pair were formed in the slit 7, and it prepared with said 1st operation gestalt so that the inside chip box binding plate 16 might advance with a form P1 between the introductory roll 8 of this pair, and 8. In the process in which two or more forms P1 are inserted by migration of the inside chip box binding plate 16 into a slit 7, since two or more forms P1 are smoothly moved by rotation of the introductory rolls 8 and 8 of a pair, inside chip box actuation can be performed, without giving a damage to a form P1 as much as possible.

[0053] With said 1st operation gestalt, the introductory rolls 8 and 8 of a pair. Since it is energized with the spring 11 which is an energization means in the direction which can move in the direction of disjunction freely, and contacts. Since between the introductory roll 8 of a pair and 8 carries out adjustable according to the thickness of two or more whole forms P1 and the predetermined pinching force is made to act with the spring 11 which is an energization means, an inside chip box can be performed to the form P1 of the whole versatility thickness. Moreover, since the introductory rolls 8 and 8 of a pair rotate in the direction to which both the pinched forms P1 are moved on the occasion of the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 16, a form P1 is pressed by the inside chip box binding plate 16, and in case it breaks inside and is carried out, in order that the introductory rolls 8 and 8 of a pair may send in both the forms P1, the inside chip box of a form P1 is performed smoothly. Furthermore, since actuation of a handle 12 is interlocked with, it rotates, in case the inside chip box binding plate 16 goes to an inside chip box binding location from a position in readiness and the introductory rolls 8 and 8 of a pair do not need to drive the introductory rolls 8 and 8 of a pair separately, its user-friendliness of a user is good.

[0054] Moreover, since the form derivation member 21 which leads the form P2 by which inside chip box binding was carried out to an eject direction was formed and it is discharged with said 1st operation gestalt to the location which the form P2 by which inside chip box binding was carried out tends to take in case the inside chip box binding plate 16 returns from an inside chip box binding location to a position in readiness, a user is user-friendly.

[0055] Moreover, since the form P2 which the pair broke into the location to which a form P2 is led, rolls 25 and 25 were formed, and this pair broke, and advanced between a roll 25 and 25 by the form derivation member 21 with said 1st operation gestalt is moved to an eject direction by rotation and a good inside chip box is made while the form P2 by which inside chip box binding was carried out is discharged to choice or a cone location, a user is very user-friendly. Furthermore, since it interlocks, it moves to actuation of a handle 12, in case the inside chip box binding plate 16 returns from an inside chip box binding location to a position in readiness and the form derivation member 21 does not need to

drive the form derivation member 21 separately, its user-friendliness of a user is good.

[0056] Furthermore, a pair breaks by said 1st operation gestalt, and since actuation of a handle 12 is interlocked with and it rotates, and a pair folds rolls 25 and 25 and they do not need to perform the rotation drive of rolls 25 and 25 separately, a user's user-friendliness is good [rolls].

[0057] In addition, since inside chip box binding equipment 1 consists of said 1st operation gestalten, without using no source of power, as compared with the conventional example, it is very producible by low cost.

[0058] Drawing 7 - drawing 22 show the 2nd operation gestalt of this invention. Drawing 7 The perspective view of inside chip box binding equipment, The outline block diagram of chip box binding equipment while, as for drawing 8, an inside chip box binding plate is located in a position in readiness, The front view of the important section of the inside chip box binding drive system of an inside chip box binding drive and drawing 10 drawing 9 The top view of the inside chip box binding drive system of an inside chip box binding drive, The front view of the important section of the form excretory system of an inside chip box binding device and drawing 12 drawing 11 The top view of the form excretory system of an inside chip box binding device, The top view of a counter device and drawing 22 of the circuit diagram of a chip box binding drive while drawing 13 - drawing 15 show each process of inside chip box binding actuation and the outline block diagram of chip box binding equipment, drawing 16 - drawing 20 show the switch position of each process of inside chip box binding actuation, and drawing 21 are the front views of a counter device.

[0059] As shown in drawing 7 and drawing 8, the case 32 of inside chip box binding equipment 31 The side plates 32a and 32a of the pair which kept fixed spacing and was set up in parallel, and backplate 32b which really connects between side plate 32a of this pair, and 32a behind, It has 32d of superior lamellas which really connect between dark room 32c which really connects between side plate 32a of a pair, and 32a ahead, side plate 32a of a pair, and 32a in the upper part. Between side plate 32a of a pair, and 32a, the form set base 33 arranged horizontally is being fixed, it is the upper part of this form set base 33, and a gap tooth space with dark room 32c is made into the feed tooth space 34, and let the lower part tooth space of this form set base 33 be the delivery tooth space 35. The form P1 with which it was superimposed on plurality from the front on the form set base 33 (laminating) is set, and the form P2 which filed during the inside chip box and was carried out from the front of the lower part of the form set base 33 is taken out.

[0060] Behind the form set base 33, like said 1st operation gestalt, the stopper member 36 is formed and a form P1 can be easily set now to the position on the form set base 33 by this stopper member 36. The stopper member 36 can be positioned free [migration to the cross direction of the form set base 33] in a proper location. Thereby, it can carry out now adjustable [of the inside chip box binding location] to a desired location about the form P1 of various sizes.

[0061] It is the front location of the form set base 33, and the form right-and-left guides 37 and 37 of a pair are formed near the edge location on either side, and it can set to a right-and-left same location, without carrying out right-and-left gap of two or more forms P1 with the form right-and-left guides 37 and 37 of this pair.

[0062] The slit 38 was formed in the center of abbreviation of the form set base 33, and this slit 38 is prolonged in the longitudinal direction, and it is fully prepared in the long dimension rather than the width of face of the form P1 which files during an inside chip box and is carried out.

[0063] The introductory rolls 39 and 39 of a pair are formed free [rotation] in the slit 38. Each of this introductory roll 39 is the product made of surface rubber of about 60 degrees of hardness, and is constituted as what requires only frictional force and does not require elasticity. The gears 40 and 40 which mesh mutually are being fixed to the end side of the pivots 39a and 39a of each introductory rolls 39 and 39, respectively. As shown in drawing 12, the introductory rolls 39 and 39 of a pair are energized with the spring 41 which is an energization means in the direction which can move in the direction of disjunction freely mutually, holding engagement of gears 40 and 40, and contacts. And the rotation drive of the introductory rolls 39 and 39 of this pair is carried out by the form excretory system of the inside chip box binding drive 42 in the direction which makes a form P1 advance into a slit 38.

[0064] Moreover, the one-way clutch which is not illustrated intervenes between each introductory roll 39 and each pivot 39a, and although rotation of the direction which makes a form P1, as for the introductory rolls 39 and 39 of a pair, advance into a slit 38 is transmitted from each pivot 39a, rotation of the opposite direction is made into transfer impossible. On the occasion of the migration in an inside chip box binding location from the position in readiness of the inside chip box binding plate 43, the free rotation of the introductory rolls 39 and 39 of a pair is carried out in the direction to which the form P1 which broke inside and was carried out is moved with the inside chip box binding plate 43 by this.

[0065] The inside chip box binding plate 43 is the upper part location of the form set base 33, and is arranged in the

upper part location corresponding to the location of the slit 38 of the form set base 33. The guide pin 44 which projects from right-and-left both ends was formed in the upper limit section of the inside chip box binding plate 43, the guide pin 44 of these right and left was inserted in the guide hole 45 prepared in the side plates 32a and 32a of a pair, respectively, and this guide hole 45 is prolonged in the vertical direction. And the inside chip box binding plate 43 drives between the position in readiness of drawing 8 which does not advance into the slit 38 of the form set base 33, and the inside chip box binding locations of drawing 15 which advances into the slit 38 of the form set base 33 by the inside chip box binding drive system of the inside chip box binding drive 42.

[0066] Moreover, it is the lower limit of the inside chip box binding plate 43, i.e., the penetration tip of a slit 38, and the needle bending section (illustration abbreviation) is prepared in the location corresponding to the staplers 46 and 46 of a pair like said 1st operation gestalt, respectively. It is fixed to the lower part location of the slit 38 of the form set base 33, and each of this stapler 46 is arranged so that the U-shaped needle (the so-called staple) 30 may be struck toward the upper part. Moreover, while being located in an inside chip box binding location, the pressure welding of each stapler 46 is carried out through a form P1 to the chip box binding plate 43, and it is set up so that a needle 30 may be struck with this contact pressure to a form P1. Furthermore, it is fixed on the stapler base 47 arranged free [attachment and detachment in a case 32], and the staplers 46 and 46 of a pair are pinched, and it can detach this stapler base 47 now and attach by actuation of 47a. The stapler base 47 consists of sheet metals which have spring nature, and while acting on a stapler 46, it eases the thrust of the chip box binding plate 43.

[0067] As shown in drawing 8, the form derivation member 48 is formed in the lower part location of the form set base 33 between side plate 32a of a pair, and 32a horizontally free [a slide]. The support pin 49 projected from the right-and-left edge of this form derivation member 48 was inserted in the guide hole 50 prepared in the side plates 32a and 32a of a pair, respectively, and this guide hole 50 is prolonged horizontally. And the form derivation member 48 drives between the position in readiness of drawing 15 which leaves from the lower part location of a slit 38, and permits penetration of a form P1, and does not lead a form P1 to an eject direction, and the derivation locations of drawing 8 which projects from the lower part location of a slit 38, and leads a form P2 to an eject direction by the inside chip box binding drive system of the inside chip box binding drive 42.

[0068] Moreover, a pair breaks into the location to which the form P2 is the lower part location of the form set base 33 between side plate 32a of a pair and 32a, and inside chip box binding was carried out [the form] by the form derivation member 48 is led, and rolls 51 and 51 are formed in it. Each of this chip box attachment roll 51 is the product made of rubber of 60 or less degrees of hardness, and is constituted as what has elasticity. This pair breaks and the gears 52 and 52 which mesh mutually are being fixed to the end side of the pivots 51a and 51a of rolls 51 and 51, respectively. Furthermore, it is energized with the spring 53 which is an energization means in the direction which a pair breaks, they are freely movable [rolls 51 and 51 holding engagement of gears 52 and 52] in the direction of disjunction mutually, and contacts. The spring force of this spring 53 is set up more strongly than the introductory roll 39 of a pair, and the spring 41 by the side of 39, in order that introductory roll [of a pair] 39 and 39 side may break and a twist may also perform chip box attachment strongly. And this pair breaks and the rotation drive of the rolls 51 and 51 is carried out by the form excretory system of the inside chip box binding drive 42 in the direction which makes the pinched form P1 discharge.

[0069] Moreover, although the one-way clutch which is not illustrated intervenes between each chip box attachment roll 51 and each pivot 51a, a pair breaks and rotation of the direction where rolls 51 and 51 make a form P2 discharge is transmitted from each pivot 51a, rotation of the opposite direction is made into transfer impossible. If a user pulls the form P2 with which the pair broke and rolls 51 and 51 were pinched by this to an eject direction, it can rotate freely and the form P2 which carried out jamming can be taken out easily.

[0070] Next, the inside chip box binding drive 42 is explained. As the inside chip box binding drive system of the inside chip box binding drive 42 is shown in drawing 9 and drawing 10, it has AC motor 60 which is the only driving source of inside chip box binding equipment 31, the 1st one-way clutch 61 is placed between the periphery of revolving-shaft 50a of this AC motor 60, and the 1st gear 62 is formed. The 1st one-way clutch 61 transmits only rotation of the counterclockwise rotation (it is the same the direction of arrow-head A, and the following at the case where it sees from drawing 9 and drawing 11) of AC motor 60 to the 1st gear 62, and the 1st gear 62 races it by rotation of the clockwise rotation of AC motor 60. The 2nd gear 63 of a major diameter meshes on the 1st gear 62, and the cam pin 65 is being fixed to this 2nd gear 63 by the eccentric location of that rotation support pin 63a. This cam pin 65 is inserted in cam hole 66a of the rocking lever 66, and the rocking lever 66 is supported by side plate 32a considering the kingpin 67 as

the supporting point. The guide pin 44 of the inside chip box binding plate 43 is engaging with the upper part side edge of the rocking lever 66, and when the rocking plate 65 rocks by rotation of the 2nd gear 63, the inside chip box binding plate 43 moves up and down. The support pin 49 of the form derivation member 48 is engaging with the lower part side edge of the rocking lever 65, and when the rocking lever 66 rocks by rotation of the 2nd gear 63, horizontal migration of the form derivation member 48 is carried out.

[0071] Moreover, the 3rd gear 64 meshes on the 2nd gear 63, pivot 64a of this 3rd gear 64 is installed even in side plate 32a of another side, and the same device (the 3rd gear 64, the 2nd gear 63, and rocking lever 66) also as the side plate 32a side of another side is established. Thereby, migration of the inside chip box binding plate 43 and the form derivation member 48 is performed certainly and smoothly.

[0072] As mentioned above, while it is at the time of rotation of the counterclockwise rotation (the direction of arrow-head A of drawing 9) of AC motor 60 and the inside chip box binding plate 43 performs both-way migration in an inside chip box binding location from a position in readiness, the form derivation member 48 performs both-way migration in a derivation location from a position in readiness. And the form derivation member 48 is located in a derivation location by the inside chip box binding plate 43 in a position in readiness, and the form derivation member 48 is located in a position in readiness by the inside chip box binding plate 43 in an inside chip box binding location.

[0073] As shown in drawing 11 and drawing 12, the form excretory system of the inside chip box binding drive 42 makes AC motor 60 which is the only driving source of inside chip box binding equipment 31 serve a double purpose as a driving source, the 2nd one-way clutch 70 is placed between the periphery of revolving-shaft 60a of this AC motor 60, and the major-diameter pulley 71 is formed. This 2nd one-way clutch 70 transmits only rotation of the clockwise rotation (it is the same the direction of arrow-head B, and the following at the case where it sees from drawing 9 and drawing 11) of AC motor 60 to the major-diameter pulley 71, and races the major-diameter pulley 71 in rotation of the counterclockwise rotation of AC motor 60. The end side of a timing belt 72 is hung on this major-diameter pulley 71, and the other end side of a timing belt 72 is hung on the minor diameter pulley 73. This minor diameter pulley 73 is being fixed to pivot 39a of one introductory roll 39. Moreover, the idler gear 74 meshed on the gear 40 fixed to pivot 39a of the introductory roll 39 of another side, one side folded this idler gear 74, and it meshes with the gear 52 of pivot 51a of a roll 51.

[0074] As mentioned above, the introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of both the rolls 51 and 51 is carried out in the direction which discharges the form P2 pinched by being at the time of rotation of the clockwise rotation (the direction of arrow-head B of drawing 11) of AC motor 60. And a pair breaks to the peripheral velocity of the introductory rolls 39 and 39 of a pair, and the peripheral velocity of rolls 51 and 51 is set up so that it may become quick in less than 20% of range.

[0075] Next, the circuitry of the inside chip box binding drive 42 is explained based on drawing 16 - drawing 20. As shown in drawing 16 - drawing 20, AC motor 60 has a common terminal t1, the method opposite side terminal t2 of a clock, and the counterclockwise rotation side edge child t3. Capacitor C intervenes between the method opposite side terminal t2 of a clock, and the counterclockwise rotation side edge child t3, a hand of cut changes by carrying out adjustable [of the power-source input to the method opposite side terminal t2 of a clock and the counterclockwise rotation side edge child t3], and it is ****. Between AC motor 60 and AC power supply 75, the start switch SW1 and the motor inversion switch SW2 intervene, and the power-source input to the method opposite side terminal t2 of a clock and the counterclockwise rotation side edge child t3 is changed to it by these two switches SW1 and SW2.

[0076] The start switch SW1 is formed in dark room 32c shown in drawing 7, and is operated by the user. This start switch SW1 is energized by the clockwise rotation selection side edge child t4 with a built-in spring, and is changed to the counterclockwise rotation selection side edge child t5 by depression actuation of a user.

[0077] The motor inversion switch SW2 is formed in the case 32 shown in drawing 8 etc., and is operated by the location of the inside chip box binding plate 43. This motor inversion switch SW2 is energized by the counterclockwise rotation selection side edge child t6 with a built-in spring, and is located in the clockwise rotation selection side edge child t7 by being pushed on the rocking lever 66 in the position in readiness of the inside chip box binding plate 43, and the location of the rocking lever 66 corresponding to that neighborhood. In the location of the rocking lever [/ in addition to the above-mentioned location of the inside chip box binding plate 43] 66, it is located in the counterclockwise rotation selection side edge child t6 according to the spring force of a built-in spring.

[0078] Next, inside chip box binding actuation of inside chip box binding equipment 31 is explained. the time of the stopper member 36 laying the form P1 of predetermined size in the form set base 33 so that the stopper member 36 may

be contacted when the case of the form P1 of predetermined size where break inside and carry out exactly in the mid-position, and filed inside and it carried out was explained to the example -- a form P1 -- it justifies so that the mid-position may turn into a location of a slit 38 exactly.

[0079] If a power source is supplied to inside chip box binding equipment 31, as shown in drawing 16, the alternating current of AC power supply 75 will be inputted into the method opposite side terminal t2 of a clock of AC motor 60, and AC motor 60 will rotate clockwise. The introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of the rolls 51 and 51 is carried out by the clockwise rotation of AC motor 60 in a form eject direction. As it is in such a condition and is shown in drawing 8, a user inserts the form P1 with which it was superimposed on plurality on the form set base 33, and it sets to the location where the insertion apical surface of a form P1 contacts the stopper member 36.

[0080] Next, a user does the depression of the start switch SW1. Then, as shown in drawing 17, a power-source input is changed to the counterclockwise rotation side edge child t3 of AC motor 60, and AC motor 60 carries out inverse rotation counterclockwise. While the introductory rolls 39 and 39 of a pair and a pair break and the rotation drive of rolls 51 and 51 is stopped by the counterclockwise rotation of AC motor 60, the form derivation member 48 starts [the inside chip box binding plate 43] migration from a position in readiness from a derivation location to a position in readiness in an inside chip box binding location again, respectively. If it descends from the upper part of a form P1, and the inside chip box binding plate 43 of a position in readiness contacts a form P1 and descends further from this condition, it will be inserted in the slit 38 of the form set base 33 with the inside chip box binding plate 43, a form P1 being bent with the inside chip box binding plate 43 in that contact location. The introductory rolls 39 and 39 of a pair carry out flattery rotation in the direction to which a form P1 is moved with the inside chip box binding plate 43, and a form P1 is smoothly inserted by descent of the inside chip box binding plate 43 into a slit 38. Moreover, migration of the form P1 inserted in connection with the inside chip box binding plate 43 and this is permitted by leaving from the derivation location whose form derivation member 48 is the lower part location of a slit 38.

[0081] Moreover, since it stops pressing the motor inversion switch SW2 in the rocking lever 66 as shown in drawing 18 and drawing 19 after being in the above-mentioned process of operation and pushing the start switch SW1 when the rocking lever 66 moves for a while, the motor inversion switch SW2 is changed to a counterclockwise rotation selection side, and even if a user cancels the depression of the start switch SW1, AC motor 60 continues rotating counterclockwise.

[0082] And if the inside chip box binding plate 43 descends to an inside chip box binding location as shown in drawing 13, the pressure welding of the needle bending section of the inside chip box binding plate 43 will be carried out to the staplers 46 and 46 of a pair through a form P1. The tip of a needle 30 where each stapler 46 performed ***** and was struck with this contact pressure by the form P1 is bent in the needle bending section. It becomes the form P2 which the form P1 with which it was superimposed on plurality broke inside, and was carried out now, and filed inside and was carried out.

[0083] Next, although the inside chip box binding plate 43 will go up shortly if the inside chip box binding plate 43 descends to an inside chip box binding location, it also stops conjointly at the location that the introductory rolls 39 and 39 of a pair do not rotate without migration of the inside chip box binding plate 43 being interlocked with with an one-way clutch, without the form P2 of the binding condition in an inside chip box going up with the inside chip box binding plate 43. And as shown in drawing 14, the inside chip box binding plate 43 goes up to a position in readiness. Moreover, the pair of an eject direction folds the form P2 with which the form derivation member 48 filed during the projection and the inside chip box, and was carried out from the position in readiness to the derivation location, and it leads to roll 51 and 51 side.

[0084] Moreover, if it is in the above-mentioned process of operation and the inside chip box binding plate 43 goes up to near the position in readiness, as shown in drawing 20, the rocking lever 66 will push the motor inversion switch SW2 again, a power-source input will be changed to the method opposite side terminal t2 of a clock of AC motor 60, and AC motor 60 will carry out inverse rotation clockwise. While the inside chip box binding plate 43 is suspended in a position in readiness and the form derivation member 48 is stopped by this in both derivation locations, the introductory rolls 39 and 39 of a pair and a pair break, and the rotation drive of the rolls 51 and 51 is carried out in a form eject direction. Therefore, a pair breaks and the form P2 which filed during the inside chip box and was carried out is discharged through between rolls 51 and 51.

[0085] As mentioned above, a form P1 is set so that it may become the location of a slit 38 about a location to break

into the form set base 33 by said inside chip box binding equipment 31 inside, and carry out. The inside chip box binding plate 43 is automatically moved in the inside chip box binding location direction from a position in readiness only by operating the start switch SW1. If it is inserted into a slit 38 and the inside chip box binding plate 43 moves to an inside chip box binding location, a form P1 breaking inside and being carried out in the location at the tip of the inside chip box binding plate 43. Since a form P1 ***** with a stapler 46 in the location at the tip of the inside chip box binding plate 43, the inside chip box location of a form P1 and an inside binding location are inevitably in agreement, and do not need to add a positioning device. Therefore, it breaks inside, and the location precision of inside binding is good and, moreover, can offer inside chip box binding equipment 31 with easy structure.

[0086] With said 2nd operation gestalt, since AC motor 60 is formed and it was made for the inside chip box binding plate 43 to move between a position in readiness and an inside chip box binding location with the driving force of this AC motor 60, an inside chip box binding activity can be performed with the driving force of AC motor 43. Therefore, while being based on hand control, a user's activity is mitigated compared with a chip box binding activity, consequently it becomes reduction of an activity mistake, and improvement in the speed of processing. Moreover, since actuation of the inside chip box binding plate 43 is stabilized compared with a chip box binding activity while being based on hand control, the quality of inside chip box binding improves. Moreover, there are not improvement in the speed of processing and instability.

[0087] Since it constituted from said 2nd operation gestalt so that the introductory rolls 39 and 39 of a pair and a pair might break and rolls 51 and 51 might rotate with the driving force of AC motor 60, and the introductory rolls 39 and 39 of a pair and a pair break and the drive of rolls 51 and 51 is made by AC motor 60 which drives the inside chip box binding plate 43, the number of motors to carry can be reduced. With the 2nd operation gestalt, inside chip box binding equipment 31 is produced by carrying one AC motor 60.

[0088] Next, the counter device 80 attached to the inside chip box binding equipment 31 of the 2nd operation gestalt is explained based on drawing 21 and drawing 22.

[0089] As shown in drawing 21 and drawing 22, the counter device 80 The worm gear 81 which displays the remaining number of stitch of staplers 46 and 46, and was fixed to support shaft 64a, On the worm gear 83 which geared with this worm gear 81 and was supported by the buttress plate 82 free [rotation], this worm gear 83, and the same axle And it consists of leaves 85 to which the dial plate 84 which can rotate separately independently, the dial plate 84, and a worm gear 83 are stuck by predetermined frictional force. The graduation is formed in the periphery of the dial plate 84 at intervals of predetermined, and both the dial plates 84 rotate according to the spring force of a leaf 85 at the time of rotation of a worm gear 83. Since angle of rotation is determined in proportion to the rotational frequency of the 2nd gear 63, a worm gear 83 remains on the dial plate 84 using this relation, and displays a number of stitch.

[0090] That is, since the 2nd gear 63 rotates one time in one ***** actuation, the 3rd gear 64 rotates only the rotational frequency decided by gear ratio with the 2nd gear 63. Moreover, the 3rd gear 64 and a worm gear 81 are the same rotational frequencies, and, as for a worm gear 83, only one gear tooth progresses by one rotation of a worm gear 81. Therefore, proportionally, the rotational frequency of the 2nd gear 62 and angle of rotation of a worm gear 83 can remain by this proportionality, and can display a number of stitch. For example, what is necessary is just to let the numbers of teeth of a worm gear 83 be 200 gear teeth, in order to make it a worm gear 83 rotate one time exactly in the place which 60 gear teeth and the 3rd gear are [100 and the 2nd gear 63] 30 gear teeth, and the number of stitch of 100 stitches struck.

[0091] If this counter device 80 is carried, a user can know the supplement stage of a needle 30, before a stapler 46 and the needle 30 in 46 are lost.

[0092] In addition, in using the needle 30 used to the middle of the number of stitch connected [one] by the needle 30 which broke in the middle of and one, a user sets the dial plate 84 to the rotation location corresponding to the number of stitch. [the connected number of stitch] If it does in this way, it remains, also when using the needle 30 used to the middle of the number of stitch connected [one] by the needle 30 which broke in the middle of and one, and a number of stitch can be displayed correctly. [the connected number of stitch]

[0093] Drawing 23 is the outline block diagram of the modification of a counter device. As shown in drawing 23, the counter devices 90 of a modification are the 2nd gear 63 and the same axle, and consist of the 1st counter gear 91 fixed by predetermined frictional force, the 2nd counter gear 92 to which it geared with these 1st counter gear 91, and the mark (an arrow head illustrates a mark location) was attached, and a mark plate 93 with which contiguity arrangement was carried out and the mark (an arrow head illustrates a mark location) was attached to these 2nd counter gear 92. The

1st counter gear 91 are made into the number of teeth carried out +one [number of stitch / N / which is set to a stapler 46 / set], and the 2nd counter gear 92 are set as the number of teeth of the set number of stitch N set to a stapler 46, and the same number. When 1 time, i.e., *****, is carried out once, the 2nd counter gear 92 will carry out 1-/N rotation of the inside chip box binding actuation with one rotation. When N time of N time, i.e., the *****, is carried out, the 2nd counter gear 92 will carry out N rotation plus 1 (= N/N) rotation of the inside chip box binding actuation. Therefore, by constituting in this way, the mark location of the 2nd counter gear 92 can make it able to stop in the location rotated one time exactly, and can display the remaining number of stitch.

[0094] In addition, with the 2nd operation gestalt, in order to ensure actuation, after setting a form P1 to the location which contacts the stopper member 36, the user considered as the configuration which carries out the depression of the start switch SW1, but if the location where the form P1 of the stopper member 36 contacts is equipped with the start switch SW1, it can carry out only with setting a form P1 as the configuration to which a start is carried out automatically.

[0095] In addition, although the electric system of automatic inside chip box binding equipment 31 is cheaply producible with said 2nd operation gestalt since AC motor 60 was used as a motor, of course, you may produce except AC-motor 60.

[0096] In addition, according to said 1st and 2nd operation gestalt, although the case of a form P1 where binding in an inside chip box was performed exactly in the mid-position was explained, when [of a form P1] filing during an inside chip box and carrying out exactly except the mid-position, it can apply similarly. Moreover, although the case where staplers 20 and 46 were formed in two places, and a needle 30 was struck to two places of a form P1 was explained, as for the number of staplers 20 and 46, it is needless to say that one piece or three pieces or more are sufficient.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The 1st operation gestalt of this invention is shown and it is the perspective view of inside chip box binding equipment.

[Drawing 2] The 1st operation gestalt of this invention is shown and it is the outline block diagram of inside chip box binding equipment.

[Drawing 3] The 1st operation gestalt of this invention is shown and it is the perspective view of the important section of inside chip box binding equipment.

[Drawing 4] It is the outline block diagram in which showing the 1st operation gestalt of this invention, and showing the condition that two or more forms were set to the form set base.

[Drawing 5] It is the outline block diagram in which showing the 1st operation gestalt of this invention, and showing the condition that an inside chip box binding plate is located in an inside chip box binding location.

[Drawing 6] It is the outline block diagram in which showing the 1st operation gestalt of this invention, and showing the condition that the inside chip box binding plate was returned to the position in readiness from the inside chip box binding location.

[Drawing 7] The 2nd operation gestalt of this invention is shown and it is the perspective view of inside chip box binding equipment.

[Drawing 8] It is the outline block diagram of the inside chip box binding equipment in the condition that the 2nd operation gestalt of this invention was shown, the inside chip box binding plate was located in the position in readiness, and two or more forms were set to the form set base.

[Drawing 9] The 2nd operation gestalt of this invention is shown and it is the front view of the important section of the inside chip box binding drive system of an inside chip box binding drive.

[Drawing 10] The 2nd operation gestalt of this invention is shown and it is the top view of the inside chip box binding drive system of an inside chip box binding drive.

[Drawing 11] The 2nd operation gestalt of this invention is shown and it is the front view of the important section of the form excretory system of an inside chip box binding device.

[Drawing 12] The 2nd operation gestalt of this invention is shown and it is the top view of the form excretory system of an inside chip box binding device.

[Drawing 13] It is the outline block diagram of chip box binding equipment while the 2nd operation gestalt of this invention is shown and an inside chip box binding plate is located in an inside chip box binding location.

[Drawing 14] It is the middle of the 2nd operation gestalt of this invention being shown and an inside chip box binding plate being returned to a position in readiness from an inside chip box binding location, and a form derivation member is the outline block diagram of the inside chip box binding equipment in the condition of having led the form by which inside chip box binding was carried out to the discharge side.

[Drawing 15] It is the outline block diagram of the inside chip box binding equipment in the condition that the 2nd operation gestalt of this invention was shown and the inside chip box binding plate was returned to the position in readiness from the inside chip box binding location.

[Drawing 16] It is the circuit diagram of a chip box binding drive while the 2nd operation gestalt of this invention is shown and the switch position of each process of inside chip box binding actuation is shown.

[Drawing 17] It is the circuit diagram of a chip box binding drive while the 2nd operation gestalt of this invention is

shown and the switch position of each process of inside chip box binding actuation is shown.

[Drawing 18] It is the circuit diagram of a chip box binding drive while the 2nd operation gestalt of this invention is shown and the switch position of each process of inside chip box binding actuation is shown.

[Drawing 19] It is the circuit diagram of a chip box binding drive while the 2nd operation gestalt of this invention is shown and the switch position of each process of inside chip box binding actuation is shown.

[Drawing 20] It is the circuit diagram of a chip box binding drive while the 2nd operation gestalt of this invention is shown and the switch position of each process of inside chip box binding actuation is shown.

[Drawing 21] The 2nd operation gestalt of this invention is shown and it is the top view of a counter device.

[Drawing 22] The 2nd operation gestalt of this invention is shown and it is the front view of a counter device.

[Drawing 23] It is the modification of the counter device of the 2nd operation gestalt of this invention, and is the outline block diagram of the counter device.

[Drawing 24] It is the outline block diagram of the inside chip box binding equipment of the conventional example.

[Description of Notations]

1 31 Inside chip box binding equipment

3 33 Form set base

7 38 Slit

8, 8, 39, 39 Introductory roll of a pair

11 41 Spring (energization means)

12 Handle

16 43 Inside chip box binding plate

19 Needle Bending Section

20 46 Stapler

21 48 Form derivation member

25, 25, 51, 51 A pair breaks and it is a roll.

60 AC Motor (Motor)

P1 Form on which it was only superimposed

P2 Form which filed during the inside chip box and was carried out

[Translation done.]

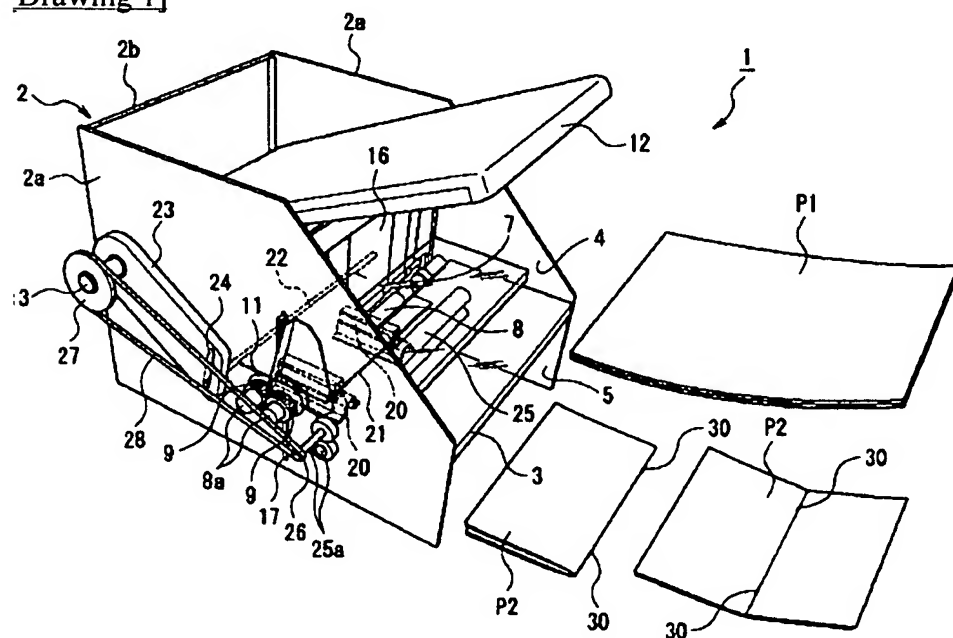
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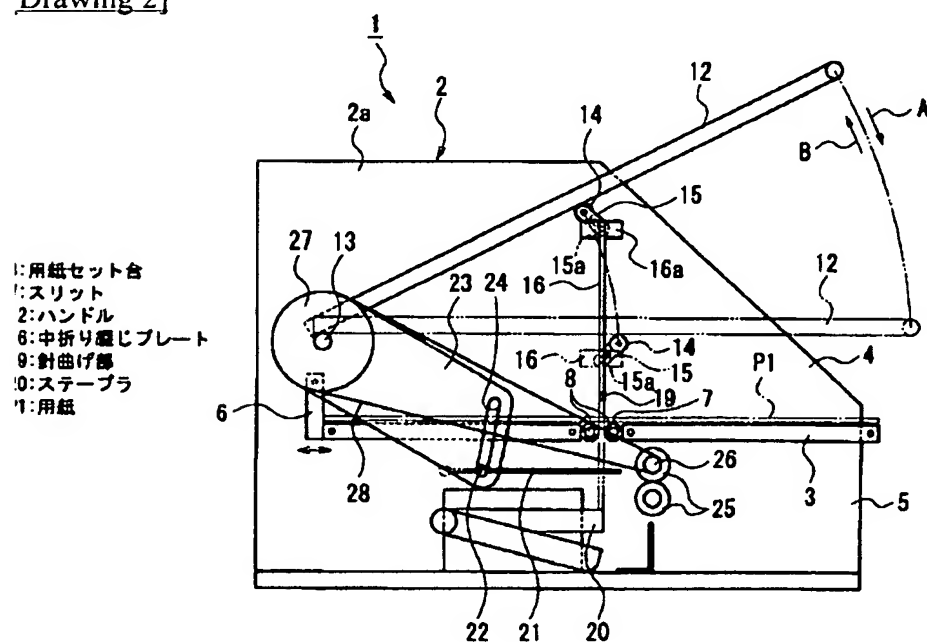
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DRAWINGS

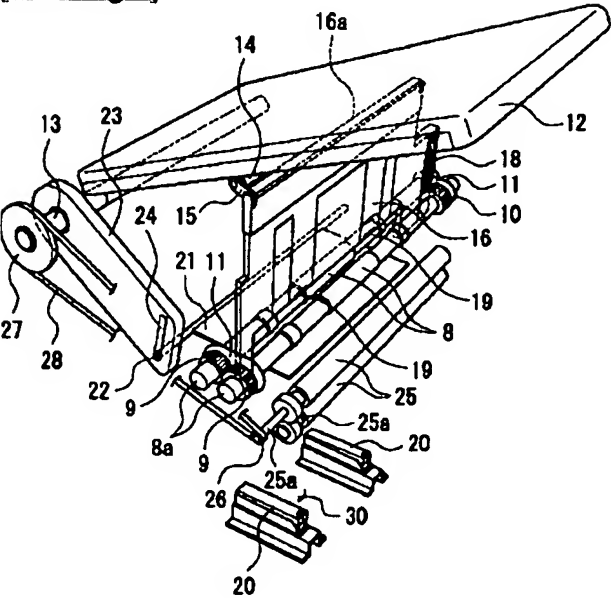
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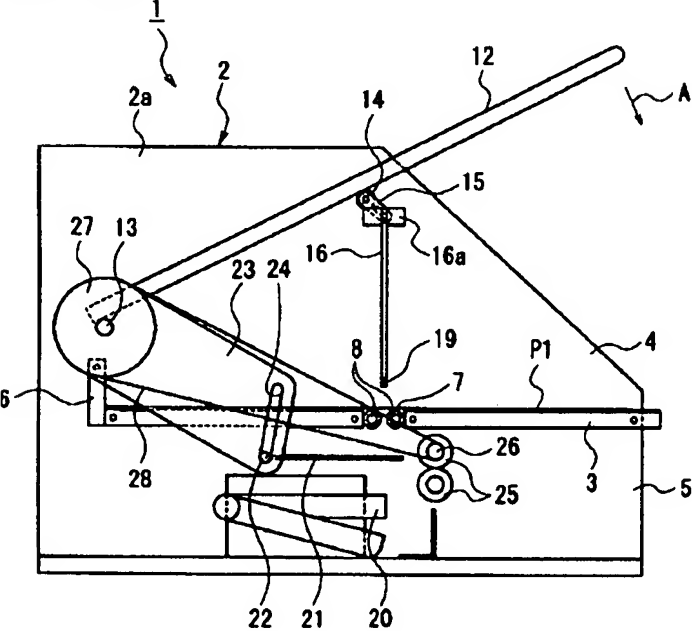
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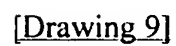
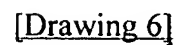
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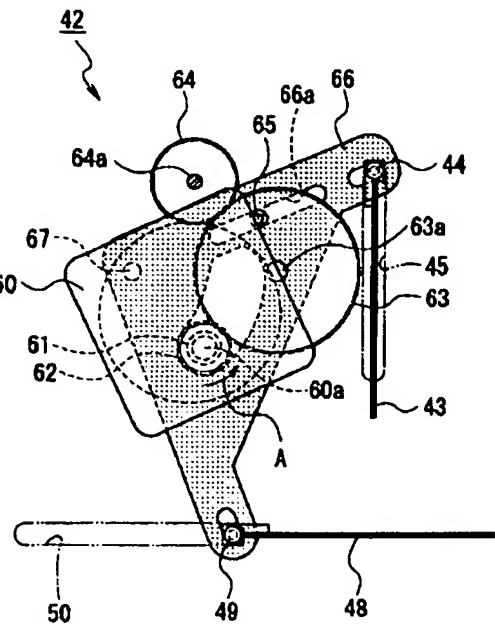


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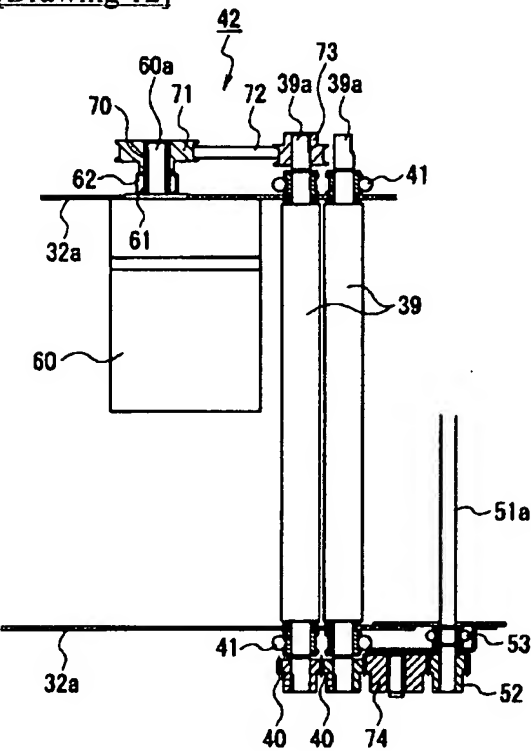


[Drawing 5]

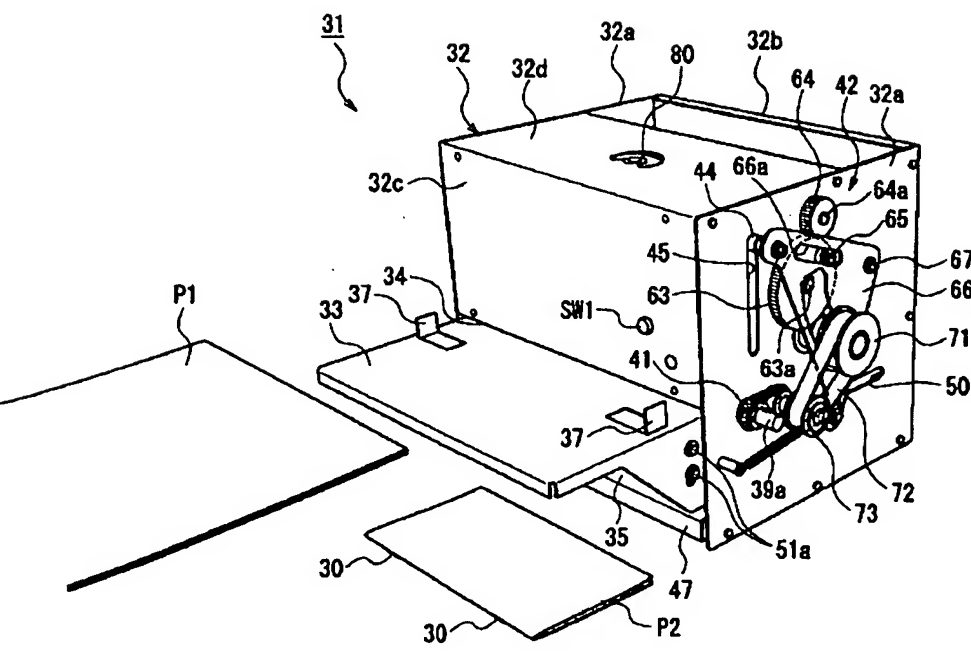




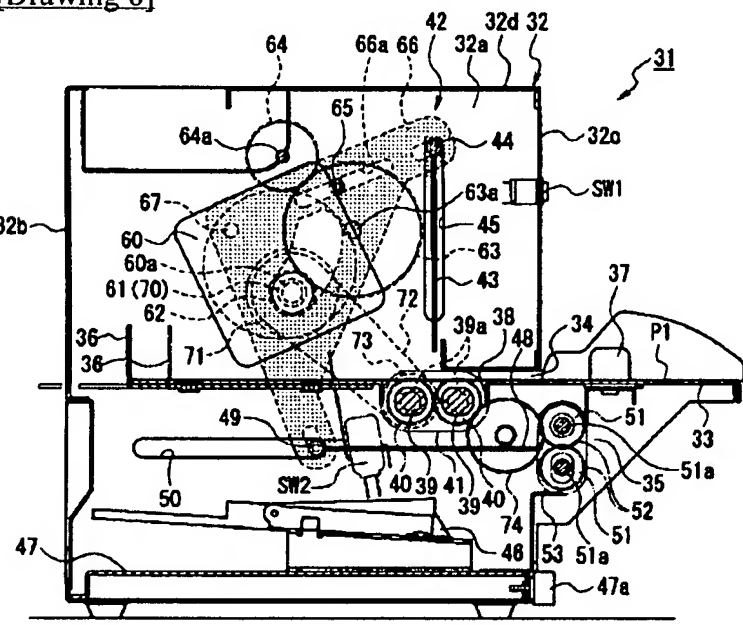
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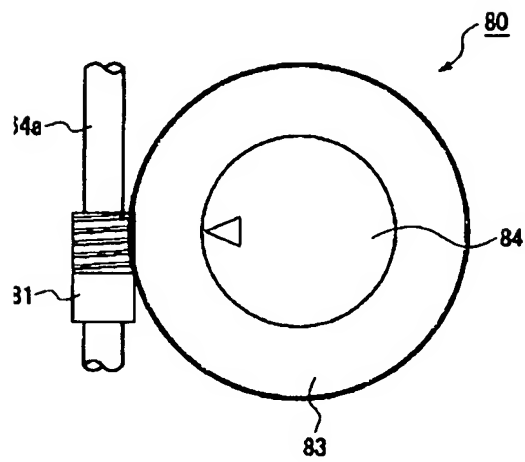
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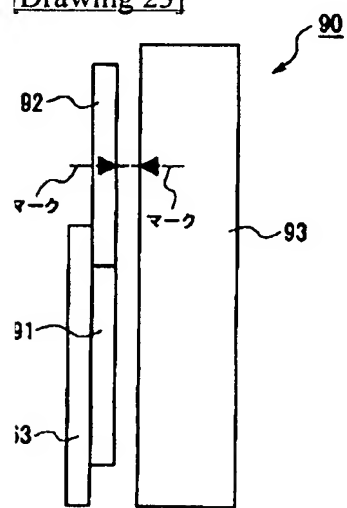
[Drawing 8]



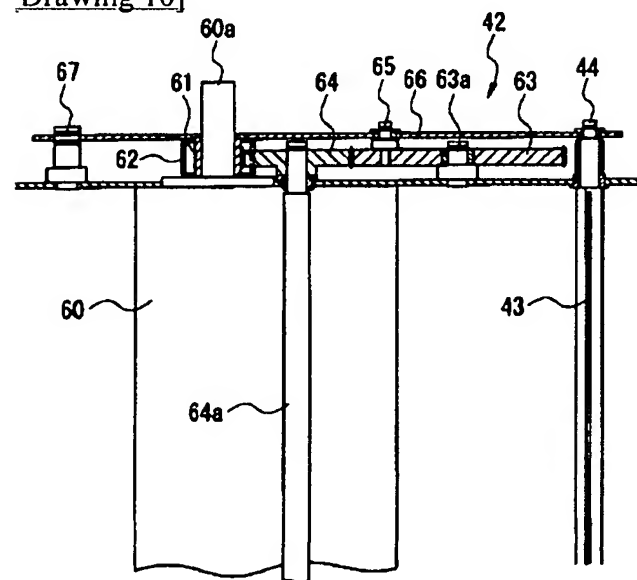
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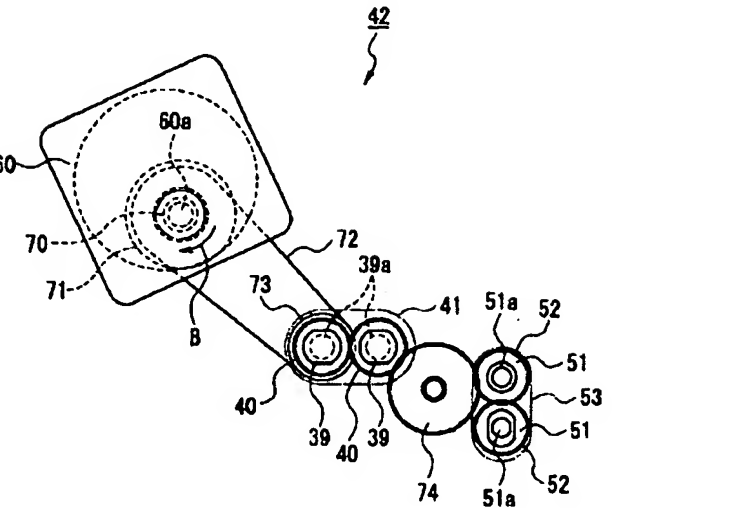
[Drawing 23]



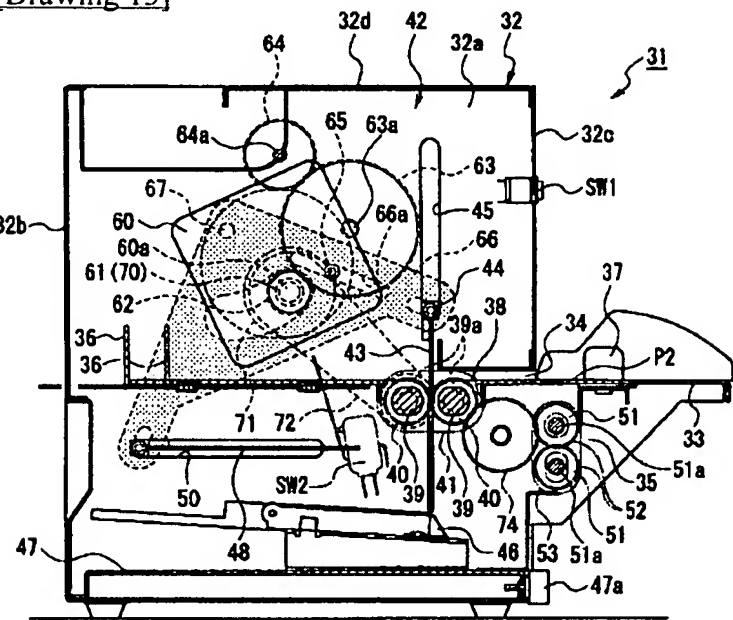
[Drawing 10]



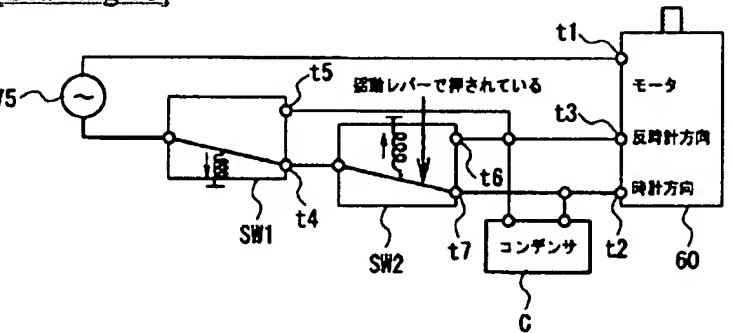
[Drawing 11]



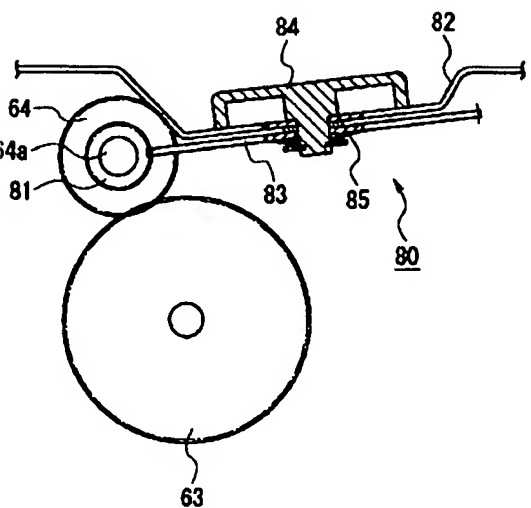
[Drawing 13]



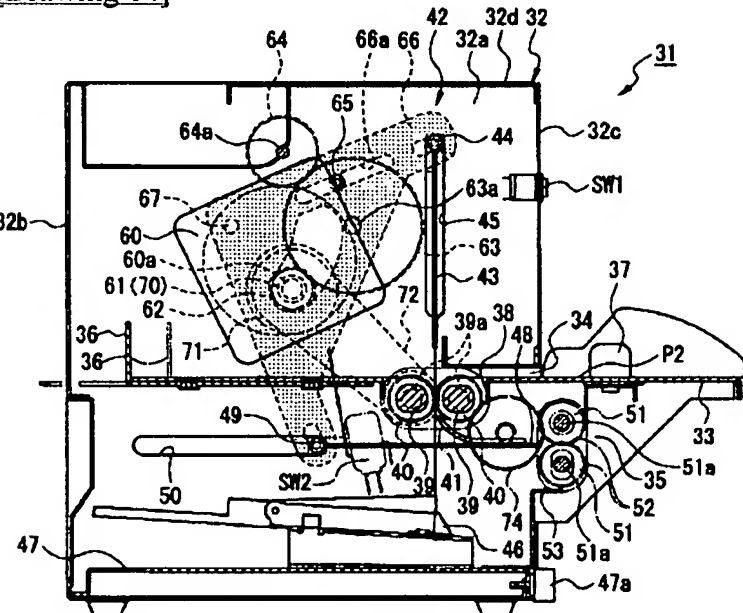
[Drawing 16]



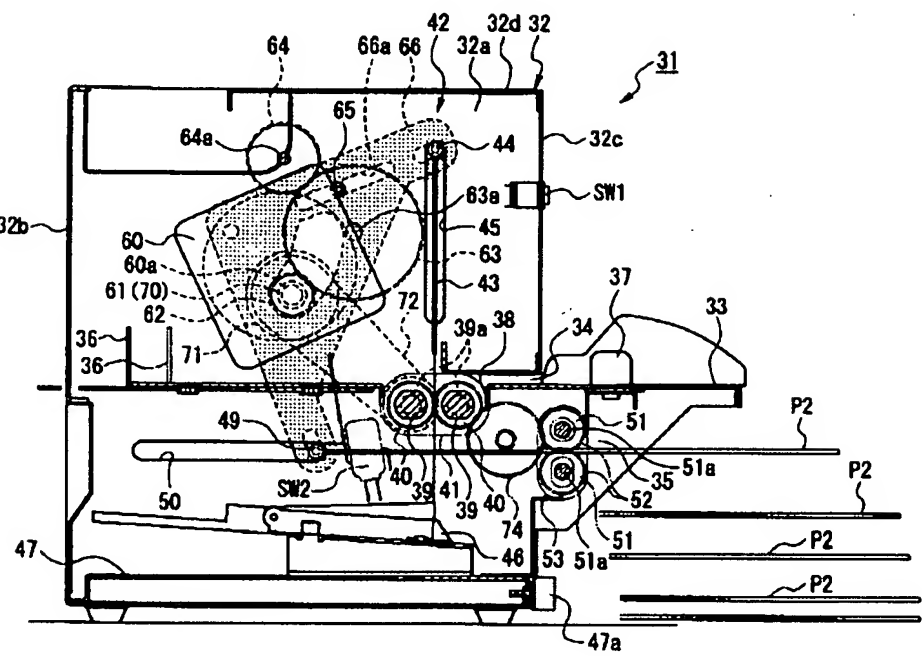
[Drawing 22]



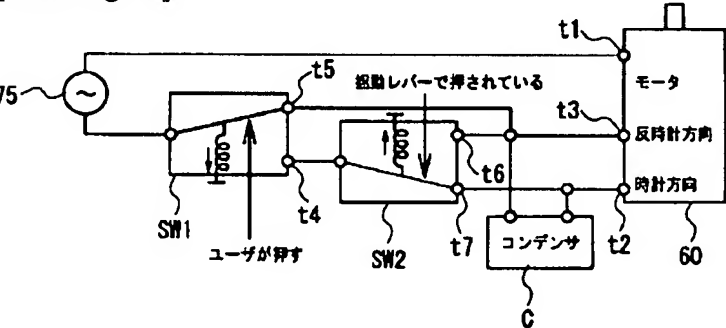
[Drawing 14]



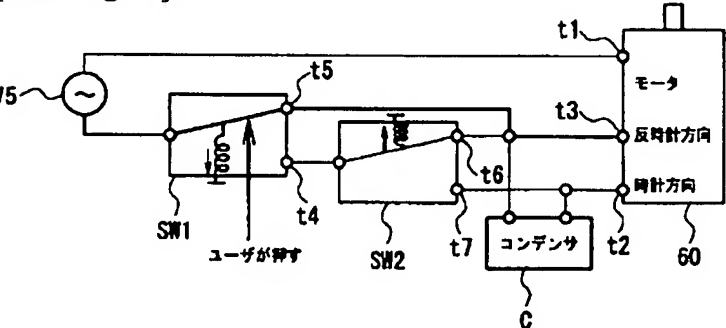
[Drawing 15]



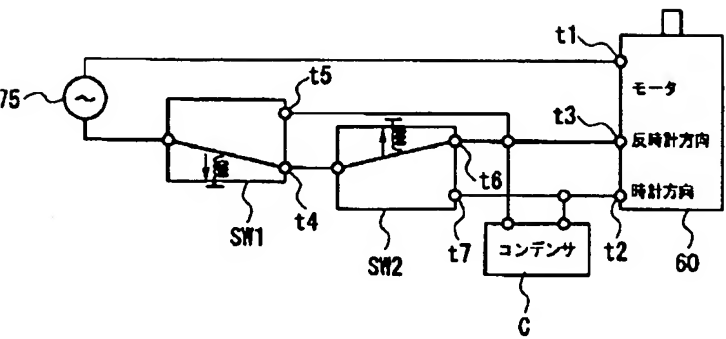
[Drawing 17]



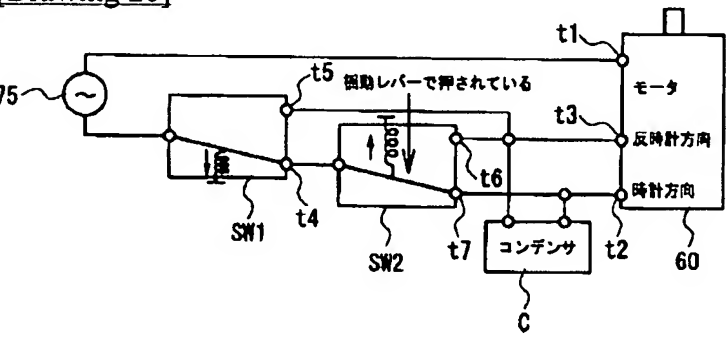
[Drawing 18]



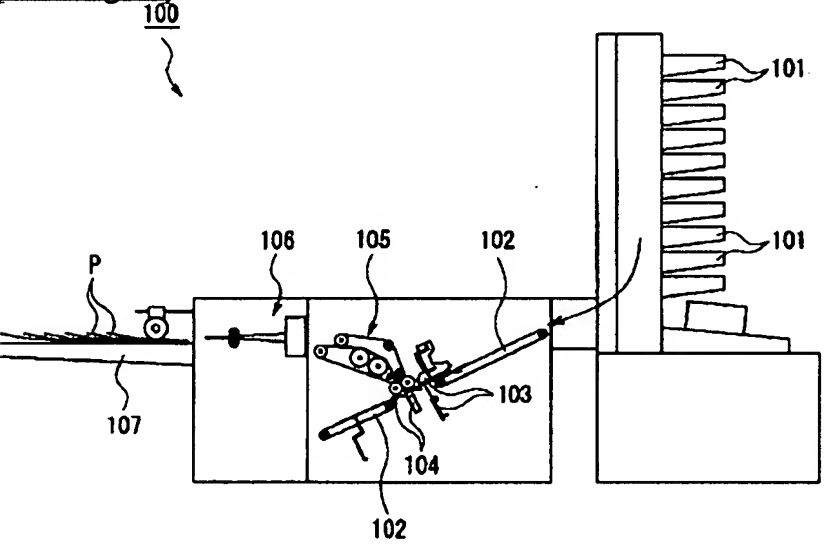
[Drawing 19]



[Drawing 20]



[Drawing 24]



[Translation done.]